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Original Articles.

ORTHOPAEDIC WORK IN A WAR HOSPITAL.

BY ROBERT B. OSGOOD, M.D., BOSTON,

Orthopaedic Surgeon to the Harvard Medical School Unit, Serving at the American Ambulance in Paris During April, May and June, 1915.

THE following description of orthopaedic work in a war hospital is based upon a three-months' service at the American Ambulance in Paris as orthopaedic surgeon with the Harvard Medical School Unit. This Unit had charge of the so-called University Service of 190 beds during April, May, and June, 1915.

It was made possible by the generosity of Mr. William Lindsey and was organized by the Medical School with Robert B. Greenough as executive officer, and directed by him and Dr. Harvey Cushing, Moseley Professor of Surgery. No leadership could have been more happy. From start to finish the *esprit de corps* of the Unit steadily increased, thanks not only to the certain confidence in the surgical ability of the leaders, but also to a consideration on their part for the mental and physical comfort of those whom they directed, which engendered affection as well as respect.

The hospital is situated at Neuilly, just outside the city walls, in a large school building, the Lycée Pasteur (Fig. 1 Hosp.), which had been nearly finished but never occupied at the begin-

ning of the war, and had been offered by the French government to a group of physicians and surgeons connected with the beautiful little American hospital in Paris, who wished to be of service to the French people. The difficulties of organization and of financing the project and of the adaptation of this school building to the purposes of a modern hospital need not be dwelt upon here. The result as one sees it today is a most amazing tribute not only to the energy and wisdom of those who have made this possible, but also to the unselfish devotion of hundreds of men and women who have given their time, and the labor of their brains and their hands to this undertaking. This should not be forgotten and must always be a source of great satisfaction to the American people as an example of practical altruism and disinterested service.

The opportunity for work at the Ambulance leaves little to be desired. If one were building a hospital of six hundred beds one would not build it like a school house, but except for minor inconveniences, chiefly affecting the administration, the equipment and the nursing service are so good that poor work can find no excuse on these scores.

In the Harvard Unit service of three months in operations on clean cases there was not a single failure to obtain first intention healing. While this is surely a splendid record for the technic of the operating room carried out by Miss Cox, the head operating nurse of the Unit, and her assistants, it is also an evidence of the facilities which the hospital afforded for excellent work. The contrast which is offered by these opportunities and the more unsatisfactory condi-



FIG. 1. American Ambulance. Formerly Lyce Pasteur.

tions necessarily existing in the temporary hospitals near the line was made very evident by the cases as they came in.

From an orthopaedic point of view perhaps the most important factor which made satisfactory work possible was the ability to keep the cases until their future treatment could be planned with some degree of wisdom, and such apparatus as was necessary could be obtained. These conditions are even better at present than they were during our service, since a convalescent home, where the treatment of cases can be continued and controlled has now been established.

The experience leads us to believe that in a war hospital the essentials for efficient orthopaedic work are:

1. A person interested in orthopaedic surgery, and in those mechanical principles which have to do with the fixation of inflamed joints and broken bones, and also with the restoration of function in stiffened joints and the obtaining of proper final alignment in fractures.

2. Proper materials with which the work may be done. (a) Dry, fine-ground plaster of Paris, and a medium meshed, starch-sized crinoline. Both these were obtained in Paris. (b) Simple shop and tools, a good vise, file, cold chisel, metal saw, breast drill, hammer, and tweezers, with small machine screws and tap, flat iron, perhaps 2 cm. wide and in at least two thicknesses, one 2-3 mm. and the other thinner, .5 to 1 mm.; iron wire of two sizes, .5 and 1 cm. in diameter, very thin stove pipe iron or sheet zinc. With this equipment one may make almost any form of metal brace, roughly to be sure, but none the less efficiently, and by painting with Japalac or covering with adhesive plaster or bandage it does not rust unpleasantly. We found in use at the Ambulance a form of glue applied directly to the skin and immediately covered with wide strips

of Canton flannel to which were sewed extension straps and a temporary gauze bandage applied. This Heusner's glue was most satisfactory and never caused the slightest irritation of the skin. It was removed with benzine, and seemed in every way superior to adhesive plaster. Its formula is as follows:

| | |
|-------------------------|----|
| B Resin | 50 |
| Alcohol | 50 |
| Benzine (pure) | 25 |
| Venice turpentine | 5 |

Sig.

Powder the resin, then add half the alcohol, the Venice turpentine, and benzine. Next wash out the measure with the remaining alcohol. Remove the glue with benzine.

A fracture table of some sort will be found of the greatest convenience, one may almost say a necessity. The Harvard Unit was supplied with the portable table designed by Dr. Robert Maddox of Cincinnati, and found it most satisfactory and equal to all the severe demands put upon it. Without going into too great detail, it consists of a series of hollow steel rods of different lengths, and steel clamps with holes to receive these rods bored at exact right angles. Various appliances, such as the steel bars of Goldthwait or the hammocks, can be fitted for the application of plaster jackets in recumbency, and an excellent extension table can be constructed on which, with the help of wooden stools, an operation may be performed. With the application of a soft leather stocking the most powerful form of lever or screw extension may be applied. At the end of the operation the patient is in a position for the application of a plaster spica while the extension is still maintained. It reminds one of the children's toy called mechano, so flexible and adaptable is it, its range being from absolute rigidity to a universal joint. One of the most useful features of it is the fact that it packs into

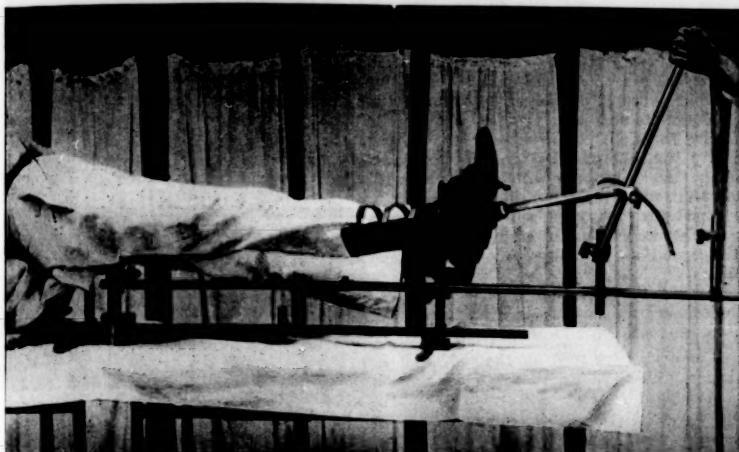


FIG. 2. Maddox table, with model in position for lever traction.

a case half as thick, half as wide, and about as long as an ordinary "dress suit" case. With the addition of a screw traction apparatus and a more generous pelvic support, it leaves in our opinion little to be desired for a working portable frame. (See Figs. 2 and 3).

3. Given interest and materials, one must have time and assistants to use them. We have seen several orthopaedic surgeons abroad "doing their bit" and doing it splendidly, but unable to do the kind of work which their training best fitted them to do and which in our opinion in this war is second in importance to none, because their time was fully occupied either with administrative matters or the routine surgery necessary on account of the septic nature of nearly all of the wounds or because they must do it alone.

At the American Ambulance all these necessary conditions were fulfilled. There was ample material to be obtained and an excellent blacksmith and carpenter who could be spared as

often as necessary for the actual labor of making copies of the apparatus devised. There was time to do this special work, thanks to the foresighted organization of the Harvard Unit, and there was the most ready help of the house surgeons and nurses constantly available. The work was made infinitely easier also by Miss Cassette, in charge of the apparatus, supplies and sewing. Much of the admirable apparatus in use at the Ambulance has been devised by her, sometimes acting on her own initiative and sometimes on the suggestions of the surgeons, but always with a keen appreciation of common sense mechanical principles. It was possible with her help to have apparatus and its fittings quickly and accurately made and to keep the necessary supplies on hand.

During the months of April, May, and June, about 450 cases were under the observation of the Harvard Unit, and of these between 20 and 25 per cent. presented some problem for the solution of which the help of the orthopaedic sur-



FIG. 3. Maddox table, with model in position for screw traction.

geon was sought. Touch with all the cases was kept by a combined visit with the surgeon to all the cases at least once a week and usually twice. The house surgeons were constantly on the watch for contracting tendons and muscles, and for joints which were in danger of becoming ankylosed or maintained in a position unfavorable for future function. Much after-treatment and deformity was undoubtedly spared by this attention. Careful records with a chronological, alphabetical, and diagnosis index were kept. It is hoped that the end results in these cases may be followed from information which has been obtained as to addresses of family and friends.

The cases with which the orthopaedic surgeon has to deal, group themselves into several classes:

- A. Simple fractures of the shafts of bones.
- B. Compound fractures of the shafts of the long bones, needing as perfect fixation as possible which would at the same time allow painless copious dressing or constant drainage.
- C. Injuries to joints, either from penetrating wounds, fractures into them, or external trauma.
- D. Ankylosis of joints, complete or partial, following immobilization or secondary inflammation.
- E. Contraction of tendons or muscles from faulty position or cicatrization.
- F. Nerve lesions resulting in paralysis and requiring apparatus.

Numerous other cases were seen in consultation with the heads of the other services, Dr. DuBouchet, Dr. Blake, and Dr. Mignot or their assistants, but unless followed are not included in this summary.

Let me take this opportunity to thank these heads of services for their great courtesy and consideration.



FIG. 4. First-aid splints of wire mesh.



FIG. 5. First-aid splints of perforated metal.

At the front many ingenious and rapidly applicable splints are in use. They are made of wire netting (see Fig. 4), perforated metal (see Fig. 5), or thin aluminum and zinc cut into patterns which can be packed flat and quickly applied over bulky dressings (see Fig. 6). They are efficient, light and comfortable, and serve well for purposes of transportation, but must be removed for all dressings.



FIG. 6. First-aid splints of thin sheet aluminum or zinc. Packed flat and bent to required shape when applied.

A. SIMPLE FRACTURES.

The group of simple fractures is included, though their treatment was more surgical than orthopaedic. They represented an interesting group of 19 cases, and resulted from various injuries directly or indirectly connected with the war, such as the fall of timbers in a dugout as the result of a shell explosion, tumbling into a trench, or being thrown from a horse. One of these was a fracture of the pubic rami treated by recumbency and a pelvic belt.

There were three fractures of the humerus. One of these was a fracture of the surgical neck

comfortable. The apparatus was worn for four weeks and union at the end of that time was firm. As was seen from the x-ray, and is suggested in the photograph, not quite enough lift of the upper end of the lower fragment was maintained to secure a perfect anatomical result, although the patient could touch his elbow to his side, and the functional result should be good. The abduction splint later devised and described in this paper would, we believe, have been most satisfactory in this case.

There were five fractures of the tibia, two oblique, ununited with bad displacement, per-



FIG. 7. Plaster and wire apparatus with shoulder straps and pelvic iron piece inserted.

so near the head as to make advisable the treatment by abduction. A wire arm splint (see Fig. 7) was incorporated in a plaster swathe and supported by a bracket wire prop (A. B.) fastened to a piece of flat iron (F. D.) which was also incorporated in the swathe and extended below it, ending in a small padded cross piece (D.) exerting pressure between the ant. sup. spine and the trochanter and retained by a pelvic webbing strap (D. E.).

The usual discomfort of a plaster swathe which supports the weight of the arm was thus obviated, since by bending out the flat iron piece (B. D., Fig. 7) and increasing the pressure at (D.) a place where pressure is easily tolerated, pressure could be relieved on the ribs at (C.) a place where pressure is most un-

feet results being obtained by an operation performed by Dr. Greenough, and consisting of reduction and the application of a Parham band. One a case of displacement and non-union in a transverse fracture, after six weeks reduced and retained by a bone plate applied by Dr. Vincent, and a fourth, transverse and fresh, reduced under an anaesthetic and retained satisfactorily in plaster.

There were four simple fractures of the femur, two in which union had begun before entrance to the Ambulance. One of these was in fair position and quite firm, the other badly outwardly bowed and soft, corrected and maintained by a plaster spica with the limb abducted. Two of the cases were old cases which were taken over by the Harvard Unit, and

represented large callous formation accompanying marked lateral displacement and overriding. These were both operated upon by Dr. Greenough and bone plated. It was a surprise and satisfaction to find that although in one case six weeks had elapsed since the displacement had occurred and there was an overriding of 5 or 6 cm., it was possible by the use of the Maddox table, combining the simultaneous possibility of adduction, abduction, and flexion, for manipulation, lever traction for force and screw traction for maintaining the amount gained and allowing the more gradual stretch of the soft parts, to secure almost perfect alignment and an end result of only 1 cm. of shortening, with firm union. The second case represented an overriding of about 4 cm.; but a lateral displacement of 5 cm. This was more difficult to overcome since it was many weeks after the fracture, and there was an enormous amount of new bone formation. It was accomplished at operation, however, by the skill of the operator and the use of the same adjustable forces, always more powerful than could be required or the patient would tolerate, but always under perfect control. Position was well maintained in a plaster spica for three weeks, but the last x-ray taken as a check before leaving showed that several of the screws had loosened and some anterior posterior displacement had recurred. It is probable, however, since little overriding exists, that at the removal of the plate a satisfactory position may be obtained and retained by a simple Buck's extension. Both operative wounds healed by first intention.

B. COMPOUND FRACTURES.

The second group comprises the compound and usually comminuted fractures. We shall not include in our consideration that large group of cases of compound comminuted fractures of the cranium or the jaws. The former received no orthopaedic attention and the mechanical problem of the latter are being wonderfully handled at the American Ambulance by the Dental Department under the direction of Dr. Hayes and Dr. Davenport. Too much cannot be said in praise of the efficiency of this department.

The compound fractures of the shafts of the long bones represented, however, the most interesting group of cases, since they presented problems which were to us new, and their solution seemed to be accomplished by somewhat unanticipated measures. They were practically all septic and this sepsis was in the majority of cases severe and accompanied by marked rise in temperature and constitutional reaction. There were 99 of these fractures, not including the compound fractures involving the bones of the hands and feet. For 33 of these, special apparatus of metal or plaster was devised.

General discussion of methods of treatment.

There are certain definite requirements:

I. The first and most important is fixation. (a) For the comfort of the patient and ease of dressing. (b) Because perfect fixation favors early union. (c) Because we believe that the danger of secondary haemorrhage is less when bone fragments are kept from moving.

II. The second is wide space for copious moist dressings and frequently for constant irrigations with hyperchlorite of soda solution 1-200.



FIG. 8. Thomas splint made of Shelby tubing. All parts adjustable by thumb screws and removable. Note length of outside upright to immobilize hip joint.

III. It is a distinct advantage if the apparatus can be applied in more or less permanent form at the time the operation for drainage and cleaning is performed, this both to avoid the second anaesthetic for the sake of the patient and save time for the surgeon.

We came over supplied with an adjustable, quickly applied and fitted Thomas knee splint (see Fig. 8) with groin rings adjustable to any size thigh, right or left, with an adjustable cross bar to which extension could be applied.



FIG. 9. Adjustable Thomas splint applied. Thoracic outside extension retained in position by swathe.

The outside upright could be carried up along the side of the chest in order to fix the hip joint and maintain, if desired, an adduction or abduction. The uprights of these splints were made of Shelby tubing $\frac{1}{2}$ inch in diameter and $\frac{1}{16}$ inch thick. This could be easily bent by the use of levers. On these uprights ran ferules bearing thin metal straps which could easily be kept clean and made to escape the wounds. An adjustable foot piece maintained right angle dorsal flexion of the foot. The splint proved very use-

ful (see Fig. 9), occasionally as an immediate application at the time of operation, but more often as a later dressing when the wounds had partly healed. As an ambulatory splint, the adjustable cross bar being replaced by a block of wood, it was most satisfactory and much used both for knee cases and for thigh fractures in which union was not absolutely solid. (See Fig. 10.)

For fractures of the humerus we were equipped with light metal coaptation splints

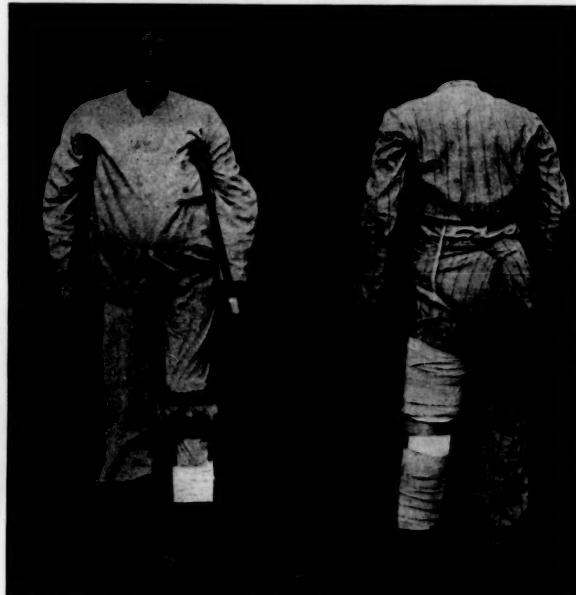


FIG. 10. Adjustable Thomas splint with wooden foot piece for ambulatory treatment.

which, quickly riveted to a light flat iron bar, furnished internal or external angular elbow splints, wrist, or hand splints.

As a matter of fact, we came to depend more and more on plaster-of-Paris for immediate dressings at the time of operation in all fractures except those of the humerus. This was in spite of the fact that we started with a distinct prejudice against this form of fixation in these severe, often septic fractures, and although those who had had wide experience had predicted that we should soon abandon this form of fixation. After the diagnosis had been made and while the operation for drainage and removal of bone fragments was still in progress, the necessary size and location of the openings in the plaster were planned. Bridges were then made of almost any kind of wire mesh, from fine chicken wire, to rolled-up screening, or from pieces of flat iron 2 cm. wide by 2-3 mm. thick. If flexible bridges with complicated curves were required, the wire mesh was chosen. If immediately rigid bridges were required or regular shapes could be used, then the flat iron was preferred. The materials were cut in the proper lengths, a plaster bandage was spread back and forth on the table a little longer than the metal, the layers being thoroughly rubbed in. This was then wrapped about the metal lengthwise and before it set bent into the shape previously determined upon, the soft projecting ends of the plaster being spread out into little fans for greater security of incorporation. When the operation was completed, as little padding as was safe was applied to the limb. About the wounds were wrapped sheets of oil silk. Over this, plaster was applied and after the first slight set the bridges, with small pads of felt under their ends, were incorporated and all the plaster about the wounds cut away, the oil silk being turned back on both sides as cuffs. The spans of these bridges were sometimes 25 to 30 cm. and in the



FIG. 11. Basket plaster in compound fracture of elbow.



FIG. 12. Basket plaster in compound fracture of both bones of lower leg. Wound now granulating.

lower leg these were often applied as runners, lifting the limb from the bed and allowing very easy dressing and constant irrigation (see Figs. 11, 12, 13, 14 and 15). As a routine these dressings were most satisfactory. They rarely had to be changed for two weeks, and then usually because they were too loose. The ample openings for drainage which the good judgment of the surgeons provided were sufficient to prevent in almost all cases an increase of swelling after the application of the plaster. Even in the badly comminuted thigh fractures the comfort of the patients was unexpected great, and both the time and the nerves of the house surgeons were conserved by them. We were always careful to arrange for the application of a tourniquet as a safeguard in the event of a secondary hemorrhage. In all cases where this seemed likely to occur, a tourniquet was kept constantly in place above or beneath the plaster. This experience is in keeping with that of Fayerweather, who has followed much the same methods at

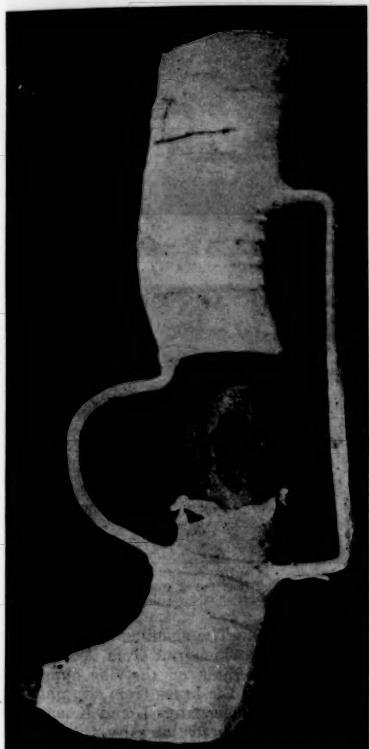


FIG. 13. Plaster with anterior arch and posterior "runner" bridges of plaster-covered malleable iron for compound fracture of both bones of the lower leg. Applied by Dr. Eliot Cutler.

the American Red Cross Hospital at Pau, and with that of Prof. Tuffier in Paris. Prof. Lange is using plaster-of-Paris freely in Munich also. It takes longer perhaps for the original application than for some other forms of fixation,

but we believe the saving of time and labor in the dressings very much overbalances the increase in initial effort.

Fractures of the Humerus.

There were twenty-eight cases treated by the Harvard Unit, including joint involvements. When we arrived, the humerus fractures were being treated occasionally on the other services by extension in bed, the arm being supported on a special and very ingenious hammock frame devised by Dr. DuBouchet and Miss Cassette, and extension being accomplished by means of a weight running over a pulley spool attached to the back of a chair. For the most part on the University service they were being treated by sling and coaptation splints with the arm held at the side of the body. The results were hardly encouraging except in the extension cases in which the arm was abducted (see Fig. 16). This excellent apparatus was somewhat restraining, needed frequent adjustment, and kept the patients in bed when often they would, except for this, have been happier and healthier and have required less care if it had been possible to have them ambulatory. There were quite too many stiff shoulders and adherent subacromial bursae which accompanied treatment with the arm at the side, and the dressings were painful and immobilization imperfect. The results must be said to have been unsatisfactory. When other fractures or general condition required that the patient should be in bed, we had great satisfaction in the use of extension, and the wooden frame above referred to, in which was a hammock attached to trolleys running on two wire rods stretched the long way of the frame. In the cases requiring constant irrigation plus recumbency, we found that comfort could be attained by plaster-of-Paris dressings with wide windows bridged by spans of plaster, the arm being abducted on a pillow placed on a chair at the side of the bed.

Very soon we began to feel the need of some form of splint which could be worn, if necessary, in bed, but should fix the arm in abduction, should provide for traction, if necessary, should



FIG. 14. Plaster with long arch and supporting rings attached to posterior bridge, for compound fracture of both bones of lower leg and multiple wounds of the anterior surface.



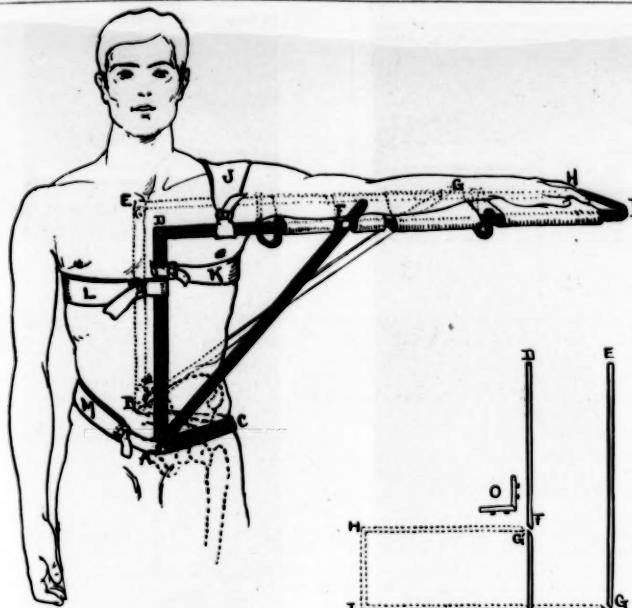
FIG. 15. Plaster applied under traction in a case of compound comminuted fracture of the femur, long bridges of wire mesh covered with plaster bandage affording generous space for dressing.



FIG. 16. Arm extension in abduction. Arm on pillow resting on board extending from bed to chair. Traction by weight over spool strung on wire fastened to chair back. Compound fracture of humerus.

permit dressings to be done with the least amount of pain, and should allow the patient to be ambulatory. Finally an abduction splint was worked out which seemed to meet these requirements fairly well. (See Fig. 17). A horizontal arm piece extends from the two flat iron uprights, AD and BE, connected on the side of the lesion by a light pelvic band, ACB, which exerts its pressure between the trochanter and the anterior superior spines. This arm piece is supported by two bracket pieces, AF and BG. There are free joints at D and E and between the uprights and the bracket pieces at A and B. AF and BG, by a series of holes bored in themselves and in the sides of the arm piece, are adjustable by means of thumb screws at various heights and positions, allowing full or partial abduction, and making it possible because of the free joints at D and E to drop the whole arm piece for dressings. The floor of the arm piece, made by winding with a bandage or adhesive plaster and cross braced with light iron in one or two places, gave increased rigidity. The horizontal arm piece was cut at F and G (see Fig. 17) and for the straight arm positions, when for example traction was desired, was fastened at these joints by a flat iron patch N, with two screws on either side of the cuts. When a right angle position of the elbow was desired, the outer end of the horizontal arm piece F I H G was turned on itself, F taking the position of F', and G the position of G', and fastened in this position by right

angle patches O. The shoulder strap J and the pelvic strap M, which ran from A to B above the crest of the ilium on the side opposite the lesion, to B, kept the brace from slipping down. and the two thoracic straps L and K maintained the position of the brace laterally, the tightening of L relieving too much pressure at C. The strap K allowed extension to be put on the arm if desired, using the rigid end of the horizontal arm piece HI as a counter point. The straps were soft, broad, and well padded. Various adaptations and neater arrangements for the brace will at once occur to those mechanically inclined. These braces, however, can be easily and quickly and cheaply built with the simple tools and materials enumerated above. Made of soft iron and on the dimensions given in the figure they were adjustable to any individual, and could be used on the right or left side, with either straight arm and traction (see Fig. 18) or with the elbow bent at a right angle (see Fig. 19). Two of the patients who needed constant fixation or traction slept comfortably in them. In the other cases they were worn during the day only, in order to maintain abduction and preserve motion in the shoulder joint and prevent adhesions in the subdeltoid bursa. We believe that in fracture of the upper half of the humerus and in severe wounds of the upper arm some form of brace which maintains abduction and allows ambulation will be found useful.



$A-B+C-B-E = 45 \text{ cm}$ long
2 cm wide
2 mm thick

$A-C-B = 45 \text{ cm}$

$B-I+E-H = 90 \text{ cm}$

$A-F+B-G = 65 \text{ cm}$

$D-F+G-H = 35 \text{ cm}$

$E-G+F-I = 55 \text{ cm}$

$H-I = 14 \text{ cm}$

FIG. 17. Outline drawing of abduction splint for arm. See text, page 118.

Compound Fractures of the Forearm; 14 Cases.

For the most part these somewhat rare injuries were easy to immobilize by plaster with bridges or by simple side splints, and presented no peculiar problems. In many cases the loss of substance of one or the other of the bones was so considerable as to necessitate a bone graft in the future, but on the university service no completely healed case occurred where this could be attempted with any likelihood of success.

Compound Fracture of the Femur; 17 Cases.

It was in these cases that we had expected to use quite generally the adjustable Thomas knee splint with chest extension upright. As a matter of fact we used this in only four acute cases. In several of the early bad compound and septic thigh fractures the wounds were so high up, both

anterior and posterior, that the groin ring would have interfered with the dressing. These cases with the help of the Maddox table were immediately placed in large plaster spicas, while traction was exerted and maintained till the plaster had set. The patients were most comfortable and could be moved with scarcely any pain. The large bridges allowed ample space for dressings and the cases did remarkably well. This became the treatment of choice in the severe open wound cases, lighter spicas with smaller bridges or simple windows or the adjustable splints being applied later as soon as conditions allowed.

I do not know who first used the webbing ankle strap method of extension, but we first saw it employed by Prof. Delbet at the Necker Hospital in Paris. While the exploratory operation was being performed two straps of soft webbing were fitted to the skin of the ankle; the one over



FIG. 18. Abduction splint applied. Arm extended with traction.

the tendo Achillis, behind, and the other over the dorsum of the foot, in front. These were then sewed to each other on each side over the two malleoli, to the ends of a loop of webbing. This loop with a spreader inserted was used for traction. The plaster, when strong traction was necessary, was applied without fear over these webbing straps, including the foot. When the plaster had set, a linear cut was made in the plaster behind, and the strap was found and cut. A second window over the dorsum of the foot allowed access to the front of the strap and cutting off the ends of the traction loop, the whole strap could be pulled out through the anterior window. As far as we are aware we had no pressure sores from these traction straps.

Prof. Delbet is using a most ingenious and, in his hands, satisfactory open apparatus for fractured thighs (Fig. 20), gaining his fixation and traction by means of a groin ring and three metal extension rods working on powerful springs, having their counter point of extension in a plaster cuff moulded directly over the skin into the suseus just above the femoral condyles. Lately, because of an occasional slough, he has been continuing plaster splints downward to make the pressure over the condyles less. He expresses himself as entirely satisfied with the results of this method.

We saw several cases in which plaster bandages in the form of flat splints, had been ap-



FIG. 19. Abduction splint applied. Elbow flexed at right angle.



FIG. 20. Apparatus used by Prof. Delbet for fractures of the femur.

plied at the front, next the skin, on fractures of the femur and lower limb. The apposition was excellent, the fixation good, and there were no abrasions. The method would seem to have advantages and to be more often applicable, as a first-aid fixation.

Compound Fractures of the Lower Leg; 28 Cases.

The wounds in these cases were generally severe and required through and through drainage and frequently for several days constant irrigation. A plan of making the posterior bridges into runners on which the leg might rest and so be lifted from contact with the bed and an arch over the anterior surface by which the limb might be lifted and from which the free portion could be supported if it tended to sag, was early adopted and proved satisfactory. (See Fig. 13.) Sometimes when the wounds were anterior or lateral, a narrow re-inforced plaster splint could be applied to the back of the leg and made rigid by an arch and horizontal rings. (See Fig. 14.) It was necessary to exercise great care in padding over the heel and dorsum of the foot and to see that the edges of the plaster on either side of the open space did not cut into the portion of the leg which occasionally tended to sag between them. With care this was avoided by supporting from the anterior bridges. One case whose tissues were of very low vitality and whose leg later had to be amputated because of extension to both the knee and ankle, had several small abrasions at these edges. Since returning we have learned of the development of an abscess

at the knee, beneath a plaster spica, apparently not from pressure, however.

On Dr. Blake's service a method of overhead traction was in use and was apparently proving very satisfactory. Light wooden frames similar to that shown in Fig. 21, were erected over the bed and the arm fractures were suspended by a combination of weights and pulleys maintaining proper lines of traction and allowing easy dressings and quite free motion of the patients through the shoulder joint. The lower leg fractures were fixed in metal splints such as the Blake's modified Thomas splint, and suspended also with the same advantages. The method has much to recommend it, but we felt that the more complete fixation of the casts and the ambulation allowed in the arm cases were advantages to be retained as long as we could gain an equal degree of comfort for the patients and the cases progressed as steadily as it seemed reasonable to expect.

C. COMPOUND INJURIES TO JOINTS EITHER FROM PENETRATING WOUNDS, FRACTURES INTO THEM, OR EXTERNAL TRAUMA.

The treatment of these injuries as a class, we believe, should be most conservative in most cases. If there were any way in which one could at the initial operation determine the extent of the septic process or predict the exact amount of reparative power of the traumatized bone, much time might be saved the patient by a radical operation. We have been impressed, however, with the unexpected, and we may say atypical,

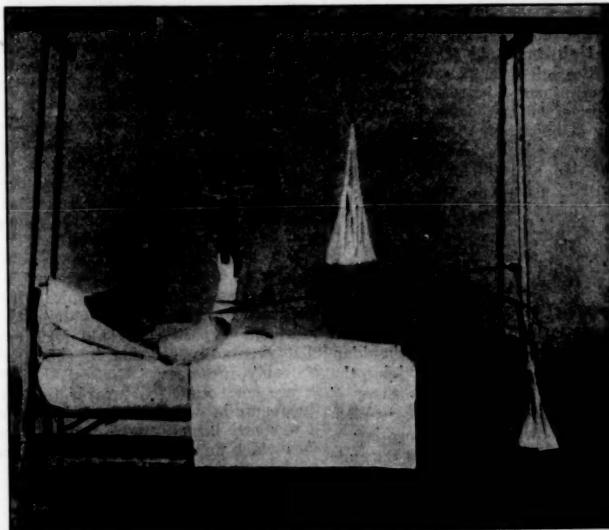


FIG. 21. Overhead frame for suspension and traction in fractures. (Service of Dr. Joseph Blake.)

power of repair which many of these cases showed. This was demonstrated in the x-rays of certain of the chronic cases, taken when the Unit took charge, and compared with the x-ray plates taken before. For example, a shoulder joint much disorganized and originally markedly septic practically excised itself, separated the head, rounded off the upper end of the lower fragment and covered it with fibrous tissue so that an operation for excision amounted practically to removing a sequestrum.

A septic compound fracture of the patella with involvement of the knee joint under complete fixation and careful dressings, gradually improved, but since there seemed little likelihood of the fragments uniting, it was planned to remove the fragments and the sequestra in order to promote healing. A subsequent x-ray taken as a precaution before doing this, showed distinct evidence of bone regeneration between the fragments, and before we left there was complete union, all sinuses had been closed for over two weeks, and there was slight movement of the patella.

It is evident that in these two cases at least Nature had performed a far more skilful operation than man could have hoped to have accomplished, and had attained a result more permanent and more advantageous. We are aware of no way of determining at operation by macroscopic appearances the extent of the power of the osteogenetic bone. We are convinced that our conceptions of bone repair must be modified and that there is danger of too little rather than too great conservatism in the treatment of these low-grade septic osteomyelitic cases.

There were four excisions of the shoulder and two excisions of the hip performed by surgeons of the Harvard Unit, but only after prolonged observation and the belief that clear line of demarcation had been formed between living and dead bone. In certain of the cases, however, it was far less easy at operation to determine this than the x-ray suggested it would be. It is our personal opinion that at least an equally good result and as speedy a healing, with perhaps a greater possibility of attaining ultimately better function, might have followed a still longer delayed operation. The function of the shoulder which, with a little help excised itself, was better than that of any other excision.

Where there were severe joint injuries accompanied by spasm, extension seemed to give great relief. This was especially true of the shoulder, the hip, and the wrist. In the wrist joint the tendency to crowding together of the mass of bones was very marked, and by applying a plaster to the flexed elbow and incorporating a frame of flat iron, extending out beyond the ends of the fingers, a satisfactory extension in addition to fairly complete fixation was attained. In these cases there was no question of conserving eventual joint motion. The problem was rather

one of free drainage and the avoidance of septic absorption from the joint surfaces.

Perforating Injuries to Joints Requiring Drainage.

There were several cases in which there were small openings into joints accompanying deep and extensive wounds of the tissues in the neighborhood; one of the elbow, three of the knee, two of the ankle. In all of these the policy of inserting only a very small rubber tissue drain was followed. The joint was then carefully watched, but in none were more extensive incisions necessary. The rubber tissue wicks were soon removed and the function of the joint was undoubtedly more conserved by the small opening and slight non-irritating drainage of short duration than if this watchful conservatism had not been practised.

One of these cases deserves special reporting. A man had received a perforating wound of his left tibia and a small abrasion of the left knee near his patella. The tibial wound had been explored and drained by a previous service. The knee wound was healed, though the joint was swollen and flexed. An x-ray showed that what was supposed to have been a simple abrasion of the knee was in reality a wound of entrance of a piece of shell which had penetrated the joint and was now imbedded in the inner femoral condyle and surrounded by an area of greater radiability. Dr. Cushing with his cranial burr tunneled the condyle without apparently opening the joint, found the cavity and a small amount of pus, and removed the foreign body. A culture showed a pure growth of gas-producing bacilli and the next day the joint swelling increased and gas crepitus could be felt in the neighborhood. With fixation, however, the joint quieted down, the wound healed, and muscle spasm disappeared. The capsule was still thickened and the joint was much relaxed when we left, two months later, but there were no acute symptoms, motion was good, and the patient could bear weight without pain, wearing a plaster cast. The fact that gas-producing bacilli can remain inactive in a bone cavity for at least six weeks and the benign character of the secondary infection in this case are interesting.

On the other hand, if severe joint infection occurs, we believe it is still as much of an axiom as ever that free drainage quite without regard to future function must be obtained. In the hip joint our experience would lead us to believe that eventually excision in these cases will be probably necessary (3 cases). In one case of severe compound fracture of the lower end of the femur in which the knee joint was involved, it was very largely the absorption from this surface which finally made amputation necessary as a life-saving measure.

Fractures into Joints.

All of these were compound except one or two simple ankle fractures. The majority were into

the shoulder joint. There was only one true intracapsular hip fracture and about an equal division between knees and wrists, elbows and ankles. They were all treated by free incision when the septic condition at entrance seemed to demand this, and by the same kinds of fixation as the compound fractures of the shafts. These cases may be expected to have completely or partly ankylosed joints or to come to eventual excision by Nature or by art. Whenever possible, quiescent joints and even slightly threatening compound joints were simply fixed, and the judgment seems to have been wise.

Joint Injuries from Trauma without Wounds.

These comprised four knees and three ankles, two old simple fractures of the malleoli and one a sprain of the external lateral ligament. These needed only adhesive-plaster strapping.

The knees were most interesting. Two represented simple wrenches with strain of the lateral ligaments and effusions subsiding under fixation in a plaster cast, the x-rays being entirely negative. In two we were unable, in spite of good x-ray plates and careful physical examinations, to make a definite diagnosis, but we believe one represented almost certainly one of those injuries to the cartilage of the femoral condyles resulting from a localized blow which, with a small area of bone necrosis beneath, represented, perhaps, an incipient osteochondritis dessicans. The other was either a similar lesion or the dislocation of a semilunar cartilage which had slipped back into place. Both these cases, although they had slight effusions, pain, and disability on entrance, were soon able to walk, without pain, in bivalunar plaster casts, and it did not seem fair in a service in which there were so many septic cases to widely explore such useful knee joints by a vertical incision through the patella, which in our opinion would have been in these cases the only satisfactory method of exploration.

D. ANKYLOSIS OF JOINTS, COMPLETE OR PARTIAL, FOLLOWING IMMOBILIZATION OR SECONDARY INFLAMMATION.

These problems were of chief orthopaedic concern, and while attention was paid to all the joints which it was necessary to immobilize in connection with fractures of the shafts, some nine shoulders, six elbows, four knees, and two wrists received special attention. There is an excellent massage department connected with the American Ambulance to which M. Floron gives his services as director. The hospital badly needed a small medico-mechanical department which we are glad to report has since been established at the convalescent home at St. Cloud. There have been installed French machines which, by ingenious attachments, make use of a single pendulum or wheel for gentle passive or active mobilization of all the different joints.

As soon as the wounds would allow, massage and gentle passive motion were begun in all cases in which motion was limited.

Shoulders.

By the use of an abduction splint (see Fig. 19) for a part of the day the tendency to adhesion in the subacromial bursa was overcome. For purposes of economy one patient wore the splint one-half of the day and another patient the same splint the other half of the day. It seemed possible when the cases were under control from the start to conserve motion in all cases where there was not a bony lesion of the joint proper. The splint was especially useful following excisions.

We question somewhat whether for the ordinary farm laborer or artisan an excised shoulder is to be preferred to a completely ankylosed shoulder fixed in a position of slight abduction. Such statistics as are available of the end results of excision of the head of the humerus for various causes in civil life are not altogether encouraging. Disease, e.g. tuberculosis, is often satisfactorily controlled, and passive motion through a considerable arc is usually possible, but there is frequently little active motion, and this of a weak character. The somewhat flail nature of the joint prevents its moving with the scapula, since the muscles which fix the head to the glenoid no longer act on the bone. For cosmetic purposes this even imperfectly controlled motion is obviously an advantage, but for laboring purposes we believe it may not be an asset.

In several of the incompletely healed cases in which ankylosis was to be expected a padded wedge whose angle could be widened was inserted in the axilla and gradually an increased amount of abduction obtained either by the yielding of the joint itself or by the stretching of the scapula muscles.

Elbows.

There were three elbow joints in which not only was motion limited, but in which that limitation allowed less than right angle flexion. In one case, not treated originally by the Unit, a healing elbow fracture had been allowed to become quite stiff at an angle more obtuse than a right angle and was quite rigid even under as great force as seemed wise to apply under an anesthetic. When a sufficient time after the septic process has elapsed, an open operation will be necessary either to gain motion or a functionally better position of ankylosis. This position might have been obtained in the course of healing with a modicum of foresight. In two other cases of fracture, by very gentle and incomplete manipulation, under an anesthetic and most gentle but continuous after-treatment, motion to less than a right angle was gained, and the patients could put their fingers to their mouths. We believe much harm may be done by too forceful and complete mobilization of these joints un-

der an anesthetic. Brisément forcé is at best a crude method of breaking up adhesions and stretching tendons and capsule and ligaments. An inflammatory reaction from it leaves such a joint stiffer than it was originally. To illustrate, an incompletely healed hip joint with a discharging sinus in marked flexion and adduction, and a shoulder joint in which the inflammatory process threatened to subside with the shoulder left stiff without abduction, were gently, very gently, manipulated under an anesthetic in order to secure a functionally better position in which an anticipated ankylosis might occur. In both these a very marked febrile reaction, 104-105° F., followed the manipulation and was accompanied by constitutional disturbance and an increased suppuration. The object was gained, but the risk was not inconsiderable, and its degree somewhat unanticipated. The pound of cure was a very heavy one. The ounce of prevention would have been light.

Wrists.

The two wrists followed prolonged immobilization without local wounds. They were both in permanent plantar flexion with apparent loss of power in the extensors and very slight passive motion in the direction of further plantar flexion. For these, continuous and lifting elastic traction was applied by means of a complete or removable cast including the elbow. To an ordinary glove (suggested by Miss Cassette) was at-

tached a webbing strap with strong elastic inserted. This strap ran over a wire bridge incorporated in the plaster and could be tightened by means of a buckle in the plaster above (see Fig. 22). Motion and a return of power in extension following the use of this simple appliance.

Knees.

One of the knees regained the desired hyperextension by massage. In one in which, following a wound of the hamstrings, there was an obstinate muscle spasm, fixation in a cast was followed by a return of painless motion. One knee represented an infectious arthritis following a wound elsewhere and accompanied by an endocarditis and a high temperature. There was marked effusion, a boggy capsule, and a flexed position. The knee quieted down and the flexion was overcome by a series of plasters. Motion was still limited, but increasing, when we left, under gentle manipulations, massage and hot baths. The fourth knee was permanently flexed 30° and very sensitive following a wound of the hamstrings. There was a true contraction of the muscles due to cicatrization. In this case full extension was gained in ten days by the use of the iron extension hinges described by Dr. W. H. Turner of Montreal (see Fig. 23). These irons are incorporated in a plaster which is cut away generously over the knee in front, and divided by a linear cut beneath the knee. It is obvious that when the thumb screw at B, travelling on the



FIG. 22. Apparatus for continuous lifting traction in partial ankylosis of the wrist. Musculo-spiral weakness.



FIG. 22. Turner's extension apparatus for flexion of the knee. See text, page 124.

threaded rod between B and C is made to approach C, the leg must extend. Because of the centering of the joint of the brace at A, above the centre of the knee joint, a distracting force is exerted as well, which overcomes any tendency to subluxation.

Many of the completely or nearly completely ankylosed joints following direct injury or adhesions following septic processes, will undoubtedly furnish before many more months wonderful possibilities for mobilizing operations of some sort. In the cases under our observation the septic process was of too recent existence to make it wise to consider such operations at this time, but we believe this will be one of the most interesting fields for post-bellum orthopaedic surgery.

E. CONTRACTION OF TENDONS AND MUSCLES FROM FAULTY POSITION OR CICATRIZATION.

There were about fifty wounds of muscle tissue which entered the hospital during the time of service of the Unit, in which it was important to watch for possible contraction as the healing process progressed. At the beginning of the service we saw many cases in which there was considerable muscular spasm, and in several, actual contraction accompanying the healing of muscle wounds. In 17 of the 50 wounds some apparatus, either plaster (12) or apparatus of some sort was applied as a preventive measure. In one case of equino varus following a haematomyelia, due to a wound of the spine, a lengthening of the tendo Achillis was done after a manipulation under an anesthetic. A "varus" brace was applied later.

We have spoken of the use of the Turner extension irons in case of contraction of the hamstrings in the previous section and of the elastic lifting traction for the wrist in cases of contraction of the flexor tendons of the wrist. The

threatened or actual contraction of the calf muscles with limitation in dorsal flexion of the foot, often presented special problems because of the presence of multiple wounds. A wire splint, which was attached to the leg by straps across the dorsum of the foot and near the knee only was very satisfactory. Ambulation was possible because there was only a soft band across the ball of the foot (see Figs. 24 and 25). By tightening padded ankle strap, A, the upper part of the brace springs away from the leg. By then tightening upper strap, B, the foot is dorsally flexed, using A as a fulcrum. A considerable

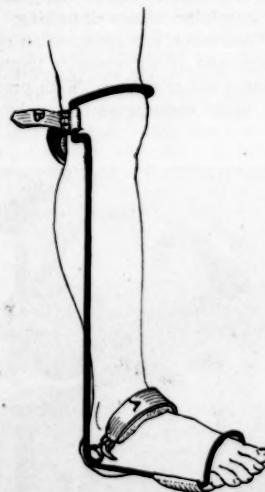


FIG. 24. Line drawing of wire splint to correct foot drop.



FIG. 25. Wire foot drop splint applied

degree of tension can be secured by its use, though one must exercise care lest with the amount of leverage force at one's disposal, too great pressure be exerted over the dorsum of the foot at the bend of the ankle. The strap here should run over a very thick pad. Repeated plaster casts and an occasional manipulation under an anesthetic followed by retention in the corrected position were sufficient to overcome other contractures.

We were impressed by the necessity of watching most carefully these cicatrizing muscle wounds. Contraction and spasm often came on very quickly, and if not speedily treated, became obstinate and crippling. With preventive apparatus these contractures may be easily avoided.

F. NERVE LESIONS RESULTING IN PARALYSIS AND REQUIRING APPARATUS.

There were many nerve lesions resulting in paralysis, the most common of which were lesions of the musculo-spiral, followed by complete or partial wrist drop and lesions of the external popliteal or peroneal nerve resulting in foot drop. These lesions are mentioned in this survey of orthopaedic work since apparatus was frequently used to retain proper position and prevent subsequent contraction of the active antagonizing group of muscles. Where there is an incomplete division of the nerve or only temporary loss of conductivity, function returns in the paralyzed group much more quickly if the tension is taken off the more powerfully innervated antagonists. This, of course, has been proven to be true many times in cases of poliomyelitis. For the wrists a simple "cock up" splint, simi-

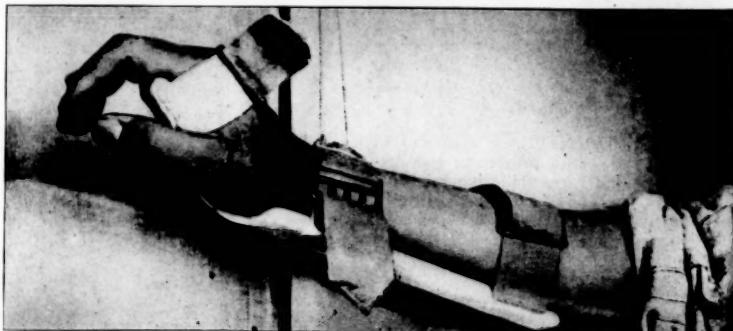


FIG. 26. "Cock up" wrist splint applied.

lar to that employed by Mr. Robert Jones of Liverpool, was made from flat iron, riveted to a palmar pad and a forearm gutter of sheet zinc, it being possible to bend the iron between the zinc pieces and retain any degree of dorsal flexion desired. This splint came to be rather generally used throughout the hospital (see Fig. 26). For the foot drop the anterior wire splint described in the previous section (see Fig. 25) was used for all active and some recumbent cases and plaster half shells holding the foot at right angles in others.

We confess to some doubt at the beginning, as to whether an orthopaedic service at a war hospital would prove interesting to the orthopaedic surgeons or be useful to the other departments of the hospital. The doubt as to the interest of the orthopaedic problems presented disappeared at once and the work assigned to the orthopaedic surgeon, seemed to answer the other question.

In connection with the Ambulance a convalescent home where the ambulatory cases may be watched and controlled and where massage, and mechano-therapy, can be had, is now established and adds greatly to the value of the orthopaedic work.

No service could have been more pleasant or profitable. The attitude of the heads of the permanent services was most cordial. The university division, of which the orthopaedic service was a part, represented one of the best examples of "team play" we have ever seen, thanks to the organizer, Dr. Greenough. The regular general visits with the surgeons, I am sure, should be a requirement in every general hospital which has an orthopaedic service, quite as much for the sake of the orthopaedic surgeon as for the special help he may be able to give. Assistance and cooperation were constant, and the work could not have been done under more favorable conditions. It seems to us most desirable that American orthopaedic surgery should accept this opportunity for service, which the unfortunate war has made necessary.

1906

SOME ANTHROPOLOGICAL COMMENTS UPON THE SO-CALLED "HERBIVOROUS" AND "CARNIVOROUS" TYPES OF MAN.

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WITHIN the past year the BOSTON MEDICAL AND SURGICAL JOURNAL has devoted considerable space to articles and editorials on physical types of man and the relation of these types to disease, eugenics, civilization and what not. From the medical standpoint it would doubtless be most advantageous if it were possible

to divide the whole of mankind into "carnivorous", "herbivorous",* and omnivorous types, each of a distinctive anatomical, physiological and psychological conformation. It would then be possible to classify a patient by a casual inspection of his complexion, stature, and girth, thence to proceed to a diagnosis of his case by a simple method of elimination.

Granted that there are tall men and short men, lean men and fat men, and that if we divide mankind on the basis of these two dimensions it will be found that the short, fat men are more liable to apoplexy and the tall, lanky men to pulmonary diseases. It is very far from the purpose of the anthropologist to cavil at any new classification of man which may be of use to medical science, but there are very grave anthropological objections to an arbitrary classification of man based on one or two anatomical characters, when that classification disregards racial differences, heredity, changes due to adolescence and old age, and the entire zoological background of man's ancestry.

In order to establish an anthropological type it is necessary to combine the results of extensive morphological observations with measurements on long series of subjects. The evidence of the existence of such a type must then be presented in concrete statistical form, and if possible, a mathematical correlation between the associated characters demonstrated.

Neither Dr. Bryant in his articles on the "Carnivorous" and "Herbivorous" Types in Man, nor Dr. Goldthwait in his Shattuck lecture on a similar theme has pursued this biometric method. Dr. Bryant offers no statistics proving a correlation between short intestines, high stature, and bodily thinness. There exist, so far as I know, no anthropometric data that furnish ground for the broad assumption that tall men are lanky and short men are fat. Anthropologists express the relation between stature and weight by the index of bodily fullness, which is obtained by dividing the weight $\times 100$ by the height cubed. This index is subject to sex, age, and race variations as well as individual variations. In the Belgians the highest index of bodily fullness, (*i. e.* greatest body mass relative to body weight) is found in the first year (male 2.97; female 2.83). In the second year it begins decreasing and continues to decrease in Europeans until the age of 11 years in boys and 10 years in girls when it reaches its minimum (1.19, 1.25). From there on it increases again until it reaches a maximum at 50-60 years (male 1.49, female 1.63), when it begins to decrease again. (Basis of Quetelet's tables.)

But are we to assume from these figures that infants hold to the "herbivorous" type, adolescents to the "carnivorous" type, middle-aged

* The choice of the word "herbivorous" is decidedly unfortunate. The idea conveyed by its use is not that of a vegetarian but of a grass-eater. The term might have been applied correctly to Nebuchadnezzar, but to no other person of whom we know.

people to the "herbivorous" type, and senile persons again to the "carnivorous" type? The average individual, classified on the basis of stature and weight, would change his type four times in the course of a long life. The point that I wish to make is that Dr. Bryant has left out of his calculations the changes in bodily form due to age, and who knows to what extent the length of the gut may vary in its absolute and relative size during the life time of the individual?

It will be noted that the index of body fullness is higher in women than in men. Dr. Bryant writes, "There can be no question but that in the human species, the female tends more to the herbivorous and the male toward the carnivorous type. Doubtless, as among the American Indians, the influence of the chase and of the meat diet worked in one direction in the men, and the sedentary habits, hard muscular work, and carbo-hydrate diet of the squaws was active in the other direction, meat and wilderness, civilization and cereals, are still in a sense synonymous." See *JOURNAL* of Sept. 9, p. 385.

The illustration of the Indians is particularly unfortunate. There is no sex differentiation in diet in the American Indians. The fact that a woman usually carries more adipose tissue than a man does not indicate that the male is more "carnivorous" either in type or in diet.

A perusal of the following figures should make clear the fact that there is no constant relation between bodily fullness and stature.

(MALES). AFTER MARTIN.

| | Stature. | Weight. | Index of Bodily Fullness. |
|-------------------------|----------|---------|---------------------------|
| <i>Europe.</i> | | | |
| Norwegians | 170.0 | 66.0 | 1.29 |
| Polish Jews..... | 161.0 | 55.0 | 1.31 |
| Swiss (Schaffhausen)... | 169.4 | 65.8 | 1.35 |
| South Russian Jews.... | 165.1 | 61.3 | 1.42 |
| <i>Asia.</i> | | | |
| Javanese | 163.5 | 50.2 | 1.15 |
| Japanese | 162.0 | 52.0 | 1.22 |
| Sudanese | 159.4 | 51.5 | 1.27 |
| Koreans | 163.1 | 56.4 | 1.37 |
| North Chinese | 167.6 | 64.4 | 1.37 |
| <i>Africa.</i> | | | |
| Bushmen | 155.4 | 40.4 | 1.07 |
| Baluba | 169.0 | 53.3 | 1.10 |

It is evident from the above table that the Bushmen who are among the shortest races of mankind are also the slimmest. On the other hand the tall Norwegians are comparatively heavy, whereas the tall Baluba of Africa are slim. The tallest Asiatic race here recorded is also the fattest, and whereas the Javanese and Koreans have practically the same average height, 163.0, which is medium, the Javanese are very thin and the Koreans are stocky. Consequently division of the human race into tall thins and short fats is a purely arbitrary classification.

In his table showing contrasted characteristics of the "herbivorous" and "carnivorous" types

Dr. Bryant makes many statements that are not substantiated by the anthropological investigations of human types which have been painstakingly and accurately carried out by two generations of scientists.

The "carnivorous" type is described as "tall and lanky"; the head is "long, large, rarely microcephalic"; pigmentation is "often excessive"; weight "usually deficient"; back "narrow, round"; forehead "often receding"; cheek bones "prominent"; chin "pointed, long, or short"; ears "thin, long, convoluted"; eyes "close together"; nose "long, thin, prominent."

There are three European races; the Nordic or Teutonic, the Alpine, and the Mediterranean. The Nordic race is tall, blond, heavy boned, and long headed. The Alpine race is usually of medium height, often stocky, pigmentation medium or dark, head round. The Mediterranean race is medium or short in stature, slender, very dark, and long headed. Evidently Dr. Bryant's "carnivorous" type does not coincide with any of the three great racial types of Europe. There are many ethnic types resulting from crosses between these three races, but the only one which corresponds in any way with the "carnivorous" type in the three great criteria of stature, pigmentation, and head form, is a Gaelic type found in western Scotland and Ireland. The potato is the standard article of diet among the Irish Gaels. Of course there may be many individuals with the physical and physiological characters described by Dr. Bryant, but, ethnically and racially, there is no "carnivorous" type, and if it exists in America it must be a very recent development.

Prominent cheek bones are usually correlated with a short broad face and a round head. Associated with long heads one expects long, thin faces, in which the malars are not conspicuous. A long head with a broad, long face and outstanding malars is sometimes found among certain Mongoloid stocks. But usually such a disharmonic type has a long head and a short, broad face, or a long narrow face and a round head. These disharmonic types are generally regarded as the result of crosses between long headed and round headed races. Individually they are comparatively frequent in Europe and America, but in the vast majority of mixed stocks head form and facial form harmonizes. Prominent cheek bones imply a broad face, and where the facial skeleton is thus formed the eyes are almost invariably far apart, and not close together, as in the "carnivorous" type. The tall Nordic race has not prominent cheek bones, nor is the face broad. One of the few racial types in which a long head is associated with a very broad face and prominent cheek bones is the Eskimo. The Eskimo is essentially carnivorous, but is also short in stature, has very heavy bones, and is inclined toward corpulence.

When Dr. Bryant says that this "carnivorous" type is "rarely microcephalic" his mean-

ing is not quite clear. Microcephaly is certainly rare and generally implies idiocy. Microcephalic idiots are generally far below normal stature. If by microcephalic the author means simply small headed we are not much better off, for cranial capacity is correlated with stature and tall races generally have large, capacious crania.

The "herbivorous" type is "short, thickset;" head, "normal, round, square, or sugar loaf;" weight "often excessive;" pigment "usually slight;" ear "thick, wide, simple;" fat "often excessive;" cheekbone "rounded;" eyes "far apart;" chin "square," etc.

This type approaches to some extent the Alpine racial type in Europe and America. But the pigmentation of this type is usually medium or dark, the cheek bones are prominent, it is not excessively fleshy, and the height is medium, except in one Balkan sub-type, the Dinaric type, which is very tall.

The form of the external ear is so variable that anthropologists have never been able to correlate any particular ear form with a racial type, except in the case of the Bushmen. It has been found that criminals in general exhibit a large percentage of anomalous ear forms; the ear in all peoples exhibits a recrudescence of growth late in life; but as a type character it is absolutely undependable.

The "herbivorous" type is said to be subject to hypertrophic arthritis, while the "carnivorous" type is liable to atrophic arthritis. In handling the skeletal remains of many races, I have found hypertrophic arthritis to be most prevalent among the ancient Egyptians, who were a short dark, thin, long headed race with very slender bones. However, hypertrophic and atrophic arthritis are common in the skeletal remains of primitive peoples of whatever height or head form.

Dr. Bryant states that exophthalmic goitre is frequent in his tall, dark, slender, "carnivorous" type. While not presuming to dispute this statement, I may point out that goitre is most prevalent in Europe in the mountain regions where the round headed, Alpine race of medium stature and medium to dark complexion is centered.

Dr. Goldthwait in the JOURNAL of June 17 recognizes similar types in his Shattuck Lecture. Describing the "herbivorous" type, he says (page 886) "The spine is broad and heavy throughout, but in the lumbar region this is especially noticeable. The lateral diameter of the vertebral bodies in this region is considerably greater than the antero-posterior, the articular processes are strong and large and almost always of the crescent shape." This statement is in general true of all human stocks regardless of physical type. He also states that "the lumbar region is short, partly because of the frequent presence of only four lumbar vertebrae and partly because the sacrum is set well down between the wings of

the ilia." Similarly in the "carnivorous" type (p. 884) "the spine is smaller than normal and the lumbar vertebrae are more like the so-called normal dorsal vertebrae in shape, the body being of about the same width laterally as it is deep antero-posteriorly. There are frequently six vertebrae in the lumbar region with the full number of sacral vertebrae, this being one of the reasons for the greater proportionate length of the body. The transverse processes are small and short, and the articular processes are usually flat (not crescentic)." The slender type of vertebra figured by Dr. Goldthwait looks much like a first lumbar. The first lumbar vertebra is phylogenetically a dorsal vertebra, since in the typical Primate the twentieth is the last rib bearing vertebral segment. Man has suffered the loss of a rib in consequence of the lengthening of the lumbar region required for the assumption of the totally erect posture and biped form of progression. Hence the first lumbar vertebra in man partakes of the character of a dorsal vertebra and is occasionally rib-bearing. I have never seen a vertebra like the one figured as the "carnivorous" type of vertebra that was not a first or a second lumbar.

In regard to the variation in the number of presacral vertebrae it may be said that 24 is by far the most usual number. The following figures may be of interest:

| 24 Presacral Vertebrae. | 25 Presacral Vertebrae. |
|-------------------------|--------------------------|
| 908 Europeans.... | 4.3% 1.2% (Bardeen) |
| 524 Europeans.... | 6.2% 2.6% (Fischel) |
| 640 Europeans.... | 3.9% 4.7% (Rabl) |
| 358 Europeans.... | 5.0% 3.0% (Keith) |

But if the number of presacral vertebrae is decreased the sacrum generally consists of six vertebrae instead of five, and if the number of presacral vertebrae is increased compensation also takes place usually in the sacrum. But Dr. Goldthwait says that his "carnivorous" type often has six lumbar vertebrae with the full number of sacral vertebrae. This then could result only from a reduction in the number of rib-bearing vertebrae.

| 13 Ribs. | 11 Ribs. |
|-------------------|--------------------------|
| 524 Europeans.... | 6.6% 0.5% (Fischel) |
| 680 Europeans.... | 6.2% 0.3% (Rabl) |
| 908 Europeans.... | 0.7% 0.9% (Bardeen) |

These two tables show conclusively that the variation in the number of lumbar vertebrae is not sufficiently common to warrant the assumption in question.

Dr. Goldthwait considers that the slender or "carnivorous" type is the more prolific, and that this, in conjunction with the efforts of preventive medicine, makes it the stock from which the race is recruited. He suggests that formerly this was not the prevalent type "as is suggested, at least, by the study of the engravings of groups of individuals, such as were commonly made from 50 to 100 years ago, in which the broad or round faced type is almost the only one shown."

A much more reliable source of information concerning the physical characters of peoples of by-gone generations, lies in the study of their skeletal remains. Anthropologists have long been aware that from the prehistoric stone ages in Europe down to the present day, round heads with short faces have been gradually increasing in number in Europe and long heads associated with long oval faces have been decreasing in number. From prehistoric times down to the present the bodily height of European peoples has fluctuated but in the mean has not changed. In England the men of the Bronze Age (1800 b.c.) were taller than Anglo-Saxons. Stature in Great Britain and Southern Germany is less than it was in early historic times. Facts, therefore, do not bear out this assumption of the probable predominance of the slender tall "carnivorous" type.

Dr. Goldthwait also states that the stocky, broad faced type is generally prevalent "in those countries in which modern medicine has exerted but little influence, and consequently infant or child mortality is extremely high. The similarity in the form of the Oriental is apparently to be explained largely by this, as it is true also of the form of the pure African. *The slender type is not often seen among these races.*" (Italics mine.) It is difficult to be sure of what Dr. Goldthwait means by "the pure African", but if, as I suspect, he means the Negro, it should be pointed out that the Nilotic Negroes, the Dinkas, Shilluk, etc., are perhaps the tallest and thinnest group of mankind. A perusal of the Asiatic group of indices of bodily fullness demonstrates also that the Oriental is by no means invariably corpulent.

| Africa. | Average Height (Males) |
|---------------------------|------------------------|
| Dinka, Nuer | 180.0 cm. |
| Sara | 181.7 cm. |
| Shilluk | 177.7 cm. |
| Baghirmi, Wadi, Fur | 178.0 cm. |

| Europe. | |
|------------------|-----------|
| Scotchmen | 174.6 cm. |
| Englishmen | 172.8 cm. |
| Swedes | 170.9 cm. |
| Italians | 163.0 cm. |
| Spaniards | 162.0 cm. |

In the issue of September 9th Dr. Bryant makes a generalization which is likewise disproven by these same Nilotic Negroes, (p 385): "At the equator light and heat are intense; plant growth is abundant, but human growth is stopped by early differentiation and maturity. . . Man at the equator eats a high carbohydrate diet, the dweller in the temperate zone uses a mixed diet, and the Arctic yields a pure meat with high fat diet."

It has been shown that the Nilotic Negroes living in the upper Nile valley and in the lake region near the equator are very far from stunted in growth. The Latuka who inhabit the upper part of the Sobat, according to the measurements of Sir Samuel Baker, have an average

height of 5 feet, 11½ inches. Their muscular development is powerful. The Turkana, the Karamojo, and the Kamasia are all people of great stature, and according to Wellby, the Turkana frequently exceed seven feet in height. One of the most famous of these equatorial tribes is the Massai who inhabit the region south east of Lake Victoria Nyanza. Sir Harry Johnston says: "The full-grown Massai of pure blood is generally six feet in height by the age of seventeen, though at that time he is often a spindly and cumbersome and ungraceful hobbledehoy. Three years, however, of an exclusive diet of milk, blood, and half-raw beef steaks, combined with a rigorous training in warlike and athletic exercise, have developed him into a sinewy and muscular man, of admirable proportions, broad of chest, with a smallish head, a graceful neck, and limbs whose muscles seem hard as iron." This is sufficient commentary on Dr. Bryant's sweeping generalization regarding stature and diet near the equator.

In the same article, summarizing Treves' evolution of animals as evinced by changes in the intestinal canal, Dr. Bryant says, "Upon the strength of this work, he stated that the carnivore, with its short simple intestine, can be traced back by way of the felines, the canines, the bears, and the racoon, through insects and cheiropetra, to the amphibians and the monotremes, among the latter of which one finds the echidna, and still lower the ornithorhynchus." This is a most amazing statement. If it is true, the ancestry of the "carnivore" jumps from various orders of the Class Mammalia to insects which do not even belong to the Vertebrata. From there the ancestral tree takes another unexpected upward shoot back to the bats, Order Cheiropetra, Class Mammalia, then downward again to the Class Amphibia, and finally back again to the Mammals in the persons of the echidna and the storied ornithorhynchus. It is almost as if one should say that the ancestry of the earthworm may be traced through the Primates to amphioxus and man, thence to the fishes, mammals, and crustaceans.

The ancestry indicated for the "herbivore" is quite as startling. We are almost led to infer that Dr. Bryant believes that the male member of the Genus Homo is descended from a cat and the female from a cow.

For reasons stated in part above, I cannot believe in the existence of the "carnivorous" and "herbivorous" types of man. Anthropologists welcome an invasion of their field by the medical profession which leads to the promulgation of interesting theories such as the one discussed. It is a laudable attempt to bring anthropology and medical science into a working partnership. I have tried to point out that the theory of "herbivorous" and "carnivorous" types of man falls to the ground because it is based largely on incorrect anthropological as-

* It is quite possible that for "Insects" we ought to read "Insectivora"—insect eating mammals.

sumptions. If students preparing for a medical course were thoroughly grounded in physical anthropology and zoölogy, it would very greatly enlarge their field of vision in their later professional career. I think that I do not go too far when I say that I feel assured that such a preliminary training in human evolution and variation would result not only in invaluable contributions to anthropology by members of the medical profession, but would also be instrumental in the advancement of medical science.

Clinical Department.

MUTISM AND DEAFNESS DUE TO EMOTIONAL SHOCK CURED BY ETHERIZATION.

BY D. PEARCE PENHALLOW, M.D., BOSTON,

Chief Surgeon, American Women's War Hospital, Oldway House, Paignton, South Devon, England.

L. H., age 25, private in the Durham Light Infantry, was admitted to the American Women's War Hospital July 30th, 1915, suffering from marked emotional shock. At the time of admission he was unable to talk but could write answers to any questions which were asked him and gave the following history:

On active duty at Ypres and had been in the trenches for about four days; he and some other men were on watch on the first of July and some of the party were sitting down in the trenches when two shells from the German lines came over the trench, the first of which fell and exploded just near his feet, killing six men and leaving only himself and a sergeant, and the second burst close to his head. Strange as it may seem, he was not wounded by either shell. Patient states that the noise was terrific and following the explosion of the shells everything became dark and he apparently lost consciousness, and he knew nothing further till he found himself in No. 8 General Hospital, Rouen. When he regained consciousness he was deaf, dumb and blind. A few days later, however, he regained his sight and shortly after that he was able to hear in one ear, still remaining somewhat deaf in the other.

Patient is a well developed and nourished man, rather confused, vague and nervous. On his first night in the hospital, he is said to have answered one question which was asked him by the nurse relative to the trouble, his answer being "concussion." Except on that occasion he did not speak and when asked to speak or make any sound he could, he made expiratory efforts but no sound; when asked to whistle he did the same, even after repeated trials. He was still apparently somewhat deaf, for if he was simply spoken to he paid no attention, but on clapping the hands near his ear or attracting his attention, he would seem to understand what was said; he also stated that he could hear a little bit better with the left ear than with the right. His

coordination, sensation, and motions were apparently normal. There was no tremor of the hands, but a somewhat marked tremor of the tongue. He walked with a slow, deliberate, careful gait, eyes on the ground, toes flexed and held rigidly—a typical "tight rope" gait. With the eyes closed he nearly fell and could not stand on one leg. Knee reflexes moderate. On plantar reflex test he pulled the whole leg away and went into a general body tremor. The toes were spastically extended and later flexed. There was marked photophobia when the eyes were tested with a small electric light.

From admission to the hospital to September 22nd, the patient made no vocal sounds, although he made many attempts. On the latter date he could apparently hear well, the gait in walking had become normal and all tremors and uncertainty had disappeared; the reflexes also were practically normal.

October first it was decided to give the patient primary ether to see if by any possible chance the relaxation would cause him to regain his speech. This was done, and during the etherization he reviewed in a loud tone of voice the whole scene which occurred at the time he lost his speech and on recovery from the ether he was able to talk perfectly well. He also stated that he could hear much better than at any time since he had been in the hospital.

This case illustrates very strikingly one of the many types of emotional shock due to the severe concussion of bursting shells and is reported simply as an unusual case of hysterical manifestation incident to the strain and tension to which the men at the front are constantly exposed.

Medical Progress.

PROGRESS IN PEDIATRICS.

LOBAR PNEUMONIA IN INFANCY AND CHILDHOOD. A SUMMARY OF THE LITERATURE OF THE PAST TEN YEARS.

BY JOHN LOVETT MORSE, A.M., M.D., BOSTON.

PNEUMONIA AND BRONCHOPNEUMONIA.

DISCUSSION was still going on at the beginning of this period as to the relative frequency of lobar pneumonia and bronchopneumonia in early life. This was especially true in England, where the hospital statistics showed a considerable preponderance of cases of bronchopneumonia (Whipham, Taylor, Dunlop). It seems to be generally recognized now, however, that the relative frequency of the two diseases is of little or no importance and that it depends largely on the source from which the statistics are drawn.

Age Incidence. The old questions as to whether lobar pneumonia occurs in infancy and, if so, what is its relative frequency in infancy,

were also being discussed at the beginning of this period. Figures were given by a number of writers to show that it did occur, although its occurrence was taken for granted by most authors. It is now generally accepted that lobar pneumonia does occur in infancy. Some statistics were also advanced, especially by the English writers, as to the relative frequency of pneumonia in infancy and childhood. The only figures of value are those of Dunlop, from the Royal Hospital for Sick Children, Edinburgh, because he is the only one who gives also the relative proportion of infants and children admitted to the hospital. In this institution 33% of the patients admitted and 30% of the cases of pneumonia were under two years of age. It would seem from these figures as if pneumonia was as common in infancy as in childhood. As a matter of fact it is of not the slightest importance whether it is more common at one age or the other, except as regards prognosis.

Macdonald has reported a case of antenatal pneumonia. The mother was ill with pneumonia when the baby was born. It was cyanotic at birth and very feeble. It coughed but little and died in twenty-eight hours. The autopsy showed a lobar pneumonia and a few other minor lesions. He gives references to the literature of the subject.

Frequency in Boys and Girls. Several papers contain statistics which confirm the well-known fact that pneumonia is more common in boys than in girls, even in infancy. The combined figures of Dunlop, Whipham and Baginsky show that a little over 60% of their patients were boys.

Mortality. Most authors have been satisfied with the statement that the mortality is high in infancy and low in childhood. Instances of the high mortality in infancy are given by Chapin for the New York Postgraduate Hospital, 36%; by Whipham for the Evelina Hospital, London, 37.5%; and by Dunlop, for the Royal Hospital for Sick Children, Edinburgh, 26.6%. Chapin states, however, that the mortality at the Babies' Hospital, New York, is only 10%. In comparison, the mortality at the Royal Hospital for Sick Children from two to twelve years of age, was only 2.9%. Many other writers call attention to the fact that the mortality is lower in private than in hospital practice. McNeil has reported in this connection a series of cases of sudden deaths in institutional children in whom the lesions of pneumonia and the evidences of status lymphaticus were present together.

Location. Otten, Weill and Mouriquand, and Dunlop have given statistics as to the location of the pneumonic process in 531 cases. The left lower lobe was involved in 41%, the right upper in 30%, the right lower in 24%, and the left upper in 5%. These figures corroborate the general belief as to the relative frequency with which the lobes are involved.

Duration. There is nothing very new as to the duration of the fever, all writers recognizing that while the average duration is about seven

days, it may be longer or shorter. Otten, in a study of 250 cases, found that the usual duration was from seven to nine days. It was less than seven days in 10%. Whipham, in a study of 150 cases, found that the duration was from five to ten days in 68%. Chapin, in his cases, found variations of from seven to twenty-five days.

Many of the authors take up the much-disussed question as to the occurrence of short or abortive cases of pneumonia. Most of them are convinced that such cases do occur. Kerr has taken this subject up quite thoroughly in a paper entitled "Twenty-four, Forty-eight and Seventy-two Hour Pneumonias in Children." His argument is as follows: The essential symptomatology of pneumonia during the first twenty-four hours is: 1. Sudden onset with immediate and sustained high temperature, and a dry, hot skin. 2. Early prostration to the extent that the child will give up and show the visible signs of his illness. 3. Markedly increased respiration, with a decided disturbance of the ratio between pulse and respiration. 4. The exclusion of all other possible causes for the symptoms. Aside from these, there are symptoms which are corroborative, such as definite physical signs in the chest, initial vomiting, chill or something which approximates it, and primary paleness of the face with subsequent unilateral flushing.

He reports six typical cases of the usual duration to show these symptoms of onset. He then argues, "If we are able to diagnose cases early, before the appearance of physical signs, which prove later to be pneumonia, why should not the presence of these symptoms alone justify the diagnosis of pneumonia?"

He reports then six cases of short duration with the typical onset and picture of pneumonia. Five had slight physical signs in the chest. All terminated by crisis.

Armstrong has reported four cases of relapsing pneumonia in young children, in which the duration was from nine to thirteen weeks. They all began acutely and showed signs of lobar consolidation. The process then spread from spot to spot, not involving the whole of a lobe at the same time. The temperature was irregular. The signs of solidification were so marked that the presence of fluid was suspected in three cases. The pneumococcus was grown from the fluid obtained by lung puncture in two instances. All the patients recovered.

Sutherland, in a paper with a title of "Chronic Pneumococcal Infection of the Lungs in Children," calls attention to the frequency of the presence of physical signs in the lungs in children which suggest phthisis. He examined the sputum of 230 children, suspected of having pulmonary tuberculosis, and found tubercle bacilli in only 9.1%. He then injected the negative sputum of 69 of these children into guinea-pigs. Only 2, or 2.9%, of these pigs developed tuberculosis; 43.5% of the guinea-pigs inoculated intraperitoneally with the sputum from

these children developed peritonitis. The organism in every case but one was the pneumococcus. The pneumococcus was also found in large numbers in the negative sputa, and was by far the most abundant organism. He believes, therefore, that the pneumococcus may and does cause a chronic affection of the lungs in children. He also calls attention to the fact that pulmonary tuberculosis is a rapid and progressive disease in children and concludes that chronic pulmonary lesions in childhood are usually not tubercular.

In this connection should be mentioned a paper by Riesman in which he describes several cases in which the physical signs were limited to a lower lobe. These signs were dullness, diminished and slightly changed respiration and rales. The temperature was slight or moderate. The duration was months and all the patients recovered. He thinks that the pathological process was bronchopneumonic in type, but confined for some reason to a single lobe.

SYMPOTOMATOLOGY.

Much has been written as to the symptomatology of pneumonia. There is little which is new, however, most of the data advanced merely corroborating or emphasizing points already well known to pediatricians. It will probably be worth while, however, to review the symptomatology briefly, as many of these points may be new to, or have been forgotten by, the general practitioner.

Temperature. The duration of the fever has already been referred to in speaking of the duration of the disease. Most writers emphasize the frequency of remissions or intermissions in the temperature in pneumonia in children, in comparison with the continued high fever in adults. Otten, however, thinks that it is more continuous than is generally believed.

The relatively greater frequency of the fall of the temperature by lysis rather than by crisis in infancy and childhood than in adult life is referred to by all. The temperature came down by lysis in 31.6%, 16% and 15.3%, respectively, of Otten's, Dunlop's and Whiphamp's patients. All mention the frequency of pseudocrises.

All those who have written about the temperature in detail emphasize the fact that the temperature is almost always high in pneumonia in infancy and childhood, and state that too much attention should not be paid to it, simply because it is high. Chapin, for example, says that the height of the temperature makes no difference in the prognosis of pneumonia in infancy, and that temperatures up to 105° F. are well borne. Dunlop, however, states that temperatures over 105° F. are of serious import. Lowenburg, on the other hand, says that energetic treatment is unnecessary unless the temperature is continuously as high as 106° F., or over, while Northrup warns against treating patients according to the indications of the thermometer,

and says that what one can know without the thermometer is far the most valuable.

Onset. Nothing new has been brought forward as to the nature of the onset of pneumonia at this period of life. Several writers emphasize the frequency of vomiting at the time of the onset, and several point out the fact that initial convulsions are not nearly so common as would seem to be the case from the text-book descriptions. Northrup sums up the early manifestations of pneumonia in infants as follows: sudden onset with fever, prostration ("dopey"), disturbed respiration-pulse ratio.

Respiration-pulse Ratio. Most writers emphasize the importance of change in the normal respiration-pulse ratio in the diagnosis in instances in which the physical signs appear late, that is, a change from the normal ratio of 1 to 4, to one of 1 to 3 or, more often, especially in infancy, to one of 1 to 2. Fleischner differs from almost all the other authors in his statement that the respiration-pulse ratio is of little importance in the diagnosis of pneumonia in infants. The reason which he gives for this statement is that this ratio is disturbed in all acute febrile conditions at this age.

Freeman describes pneumonic respiration as inspiration, pause, expiration with grunt. Ott describes a post-inspiratory pause which he considers pathognomonic. He says: "The respiration of pneumonia in infancy and childhood has a positive and pathognomonic post-inspiratory pause. This pause is not continuous. There are usually three to five post-inspiratory pauses, then follows rapid rhythmical respiration without a pause, which ends in one post-expiratory pause, and then the post-inspiratory pauses begin again. There is a different cycle in the recurring post-inspiratory pauses, which vary in number from two as a minimum to six as a maximum before the period of rapid pauseless respiration sets in." The peculiar point is the single, long expiratory pause which links the two changes. He names this symptom the pneumonic-respiratory-pause-cycle.

Physical Signs. Almost everyone calls attention to the absence or indefiniteness of the physical signs in the lungs in the early days of the disease and to the fact that in some instances they may not appear until at the time of, or even after, the crisis, and sometimes may always be lacking. Almost everyone also believes that it is possible to make a diagnosis of pneumonia in the absence of physical signs. Freeman's statements that "the most important fact is that the pneumonia of infancy is a disease that should be recognized independently of signs ascertained by percussion or auscultation of the chest, such signs being valuable to corroborate the diagnosis and to locate the lesion," and "the general picture of the disease is usually sufficient for an accurate diagnosis, and if one waits for the physical signs elicited by auscultation and percussion he may have to

wait until the patient is convalescent or never make a diagnosis in a well-marked case," represent very well the general feeling as to this point. Fleischner stands practically alone when he states that the diagnosis in infancy must be made on the physical signs.

Fleischner emphasizes the fact that a diminution in the intensity of the respiratory murmur on the affected side is the most characteristic sign of the early stages of the disease. He also states that light percussion will bring out changes which will be missed by heavy percussion. Dunlop calls attention to the frequency and importance of a tympanitic percussion-note in the early stages. He also calls attention to the absence of crepitant râles in the beginning of pneumonia in infancy. Northrup, on the other hand, speaks of râles as an early sign. Several writers call attention to the well-known fact that the signs of solidification are often first evident high in the axilla.

The investigations of Weill and Mouriquand with the Roentgen ray seem to have settled the much-discussed question as to the existence of central pneumonia. Their results also explain the late development or absence of physical signs in many instances and the early appearance of signs in the axilla. They show that the pneumonic process never begins in the centre of the lobe, but always on the surface. The first shadow is triangular in shape, the base being at the surface of the lung. This triangle is often visible when there are no physical signs. In many instances, however, more careful examination in this area will reveal slight signs which were not previously noted. The absence of physical signs may be due to the small size of the area of solidification, to the fact that it does not reach a large bronchus, or to its situation high in the axilla, beneath the shoulder joint, or at the base of the lung. The triangular shadow gradually increases in size, the apex drawing nearer to the root of the lung. Finally it is obscured as the process extends and becomes more general. It reappears during resolution and is the latest as well as the earliest picture. Their work has recently been confirmed by Mason of New York, but his results have not yet been published.

A number of authors, notably Dunlop, have called attention to the rapidity with which the physical signs of pneumonia disappear in infants and children after the crisis. Several authors, basing their opinion on this usual rapidity of disappearance, state that if the physical signs persist, there is always some complication present, usually empyema, sometimes tuberculosis. In the writer's opinion, this statement is too sweeping, because he has seen the signs persist for several weeks, and in some instances months, and then quickly clear up in a few days. Sutherland has hinted of such conditions in his paper, already quoted. In general, however, the rule holds that persistence of the physical signs

means the development of some complication, usually empyema.

Pain. Almost everyone who has written regarding the symptomatology of pneumonia in childhood has emphasized the fact that the pain in pneumonia at this age is often referred to the abdomen, and that the younger the child the more likely is the pain to be so referred. They all call attention to the danger of mistaking pneumonia for some acute abdominal condition, especially appendicitis, on this account. They emphasize the importance of the change in the respiration-pulse ratio and of the absence of localized muscular spasm in the diagnosis. A few call attention to the facts, which are often forgotten, that the primary trouble may be in the appendix, that a child may have both pneumonia and appendicitis, and that appendicitis may develop in the course of pneumonia.

Cough. Northrup and Freeman emphasize the importance of cough as an early symptom in the diagnosis in cases in which the physical signs in the lungs are late in making their appearance. Lowenborg, on the other hand, calls attention to the fact that cough is often not a prominent symptom and that it may not develop for several days.

Rigidity of Neck and Upper Extremities. Freeman makes a point of the value of rigidity of the neck and upper extremities without rigidity of the lower extremities in diagnosis in early cases before the appearance of signs in the lungs. This rigidity is the result of the soreness of the chest and the child's effort to protect it.

Meningeal Symptoms. Many writers speak of the frequency of symptoms of meningeal irritation in pneumonia at this age, and of the infrequency of true pneumococcus meningitis. Otten, in a study of 250 cases, found symptoms of meningeal irritation in 34, or 13.6%. Two of these children had purulent meningitis, two had uremia from nephritis, and four had a severe general infection. In 26 the condition was what he terms "meningismus." Focal symptoms were absent in all of these and all recovered. The fluid obtained by lumbar puncture in three instances was increased in amount and under high pressure. It was clear and contained very few cells and no organisms. He refers to Kirschheim, who got similar results from lumbar puncture in thirteen cases. He concludes, therefore, that the meningeal symptoms in pneumonia are due, in the vast majority of instances, not to inflammatory conditions, but to circulatory disturbances.

Albuminuria and Nephritis. Otten found albuminuria in 115 of 250 cases, 46%, and nephritis in 4, 1.6%, of whom two died.

Leucocytosis. Most writers have said very little about the leucocytosis of pneumonia in children, merely referring to it as being present. A few have given figures. Chapin, for instance, found a polynuclear leucocytosis in all but one of 17 babies. The baby which did not show a leu-

cocytosis was very feeble, showed all the evidences of poor resistance and died. There was, however, an increase in the proportion of poly-nuclear cells in this instance, as in the others. The highest count was 34,800. Otten found a white count of from 15,000 to 20,000 in about three-quarters, and of from 25,000 to 52,000 in about one-quarter of 72 cases. The counts were normal in a very few. In only one instance did the count fall before death.

Bacteriemia. Otten made bacteriological studies of the blood in 70 cases and found pneumococci in the blood in 9, or 13%. Four of these children lived and five died. He was unable to make out any relation between the clinical picture and the bacteriological findings.

Complications. Everyone has called attention to the frequency of empyemas as a complication of pneumonia in infancy and childhood, the difficulty in its diagnosis and the methods to be used, the importance of its early recognition as regards prognosis, especially in infancy, and its high mortality in babies. Nothing new has, however, been added to our knowledge. Several have called attention to the frequency of otitis media as a complication. Otten states, probably truly, that it is the most common complication. Barrington-Ward reports a case of pneumococcal abscess of the lung in a boy of six and gives a brief review of the literature of this rare condition. The fact that Otten had three cases in a series of 250 suggests, however, that it is not so rare as has been supposed.

(To be concluded.)

Reports of Societies.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS.

STATED MEETING, HELD MAY 10, 1915.

(Continued from page 95)

The President, DR. GERALD B. WEBB, Colorado Springs, Colo., in the Chair.

The Second Annual Meeting of this Association was held at the New Willard Hotel, Washington, D. C. After the meeting of the Council the scientific program was taken up.

AN ANALYSIS OF THE VALUE OF LABORATORY METHODS USED IN THE EXAMINATION OF CEREBROSPINAL FLUID.

DR. RICHARD DEXTER and DR. CLYDE K. CUMMER of Cleveland, Ohio, presented this paper. They stated that they had examined a number of spinal fluids by means of the Wassermann reactions, cell count, globulin reaction, and more recently by the Lange colloidal gold reaction. During the past year and one-half they had been using even larger amounts of spinal fluid in doing the Wassermann reaction than had been used by Swift and Ellis.

They had followed the technique described by Waller and Swift, using increasing amounts of spinal fluids, 0.1 c.c., 0.2 c.c., 0.3 c.c., 0.4 c.c., 0.5 c.c., and 1.0 c.c. In a series of 177 spinal fluids from cases with indubitable signs of lues of the central nervous system in which these various amounts were used it was evident that by using 1.0 c.c. of spinal fluid as a maximum amount a positive Wassermann reaction was obtained in 21.4% more fluids from known luetics than when only 0.5 c.c. was used as a maximum. A comparison of the positive Wassermann reactions in the spinal fluids with their cellular complement and globulin was of interest. Out of 63 cases in which the cell count and globulin was done and in which the Wassermann reaction was positive with amounts of 0.5 c.c. of spinal fluid or less, they found that both cell count, and globulin were increased in 69%, the cell count alone was increased in 1.5%, globulin alone was increased in 14.3%. Neither cell count, or globulin was increased in 14.3%. On the other hand, out of 78 fluids showing a positive Wassermann reaction in 1.0 c.c. only, they found that both cell count, and globulin were increased in 16.5% cell count alone was increased in 11.1%, and globulin alone was increased 16.5% neither cell count or globulin was increased in 55.5%. It was apparent therefore that when the Wassermann reaction was positive in 0.5 c.c. of the spinal fluids or below the greater were the chances that there would be an accompanying increase in the cell count and globulin content. Whereas, in those fluids which showed only a positive reaction in amounts above 0.5 c.c. one was less likely to find an increase in the cellular elements or the amount of globulin. The importance of this from a diagnostic standpoint was obvious. The question as to whether non-specific binding might not occur when such large amounts of spinal fluids were used would naturally arise and they felt that the answer to this question might be found in the following observations: Out of a total of 132 spinal fluids where lues were either non-existent or non-active, they found only one which reacted positively to the Wassermann reaction when the maximum dose of ten times the lowest dose of spinal fluid was used and this was by no means a strong reaction, as against 131 which were negative under the same conditions. After describing Lange's colloidal gold reaction and his findings the assayists stated that it was their experience that the curves described by Lange occurred with considerable regularity. They had followed the technique laid down by Lange in his original article.

In summing up the results of this investigation of 48 cases of syphilis involving the nervous system they had found the cell count increased in 33 or 68.7%. The globulin content was increased in 32 or 66.6%, which paralleled the cell count very closely. The Wassermann reaction was positive in 34 or 70.8% of these 48 spinal fluids, while they found either strong or weak positive colloidal gold reactions in 77.1% of the cases. It was probable that the high percentage of positive Wassermann reactions obtained in this series was due to the fact that 1.0 c.c. of spinal fluid, ten times the Wassermann test dose, was used as the maximum amount. In spinal fluids from 23 cases without any sign of syphilis they had found 21 negative colloidal gold tests and two very weakly positive reactions. In three cases of tuberculous meningitis from which they had examined the spinal fluid they had not seen the typical curve described by Lange and others.

DISCUSSION.

Dr. WM. E. ROBERTSON, Philadelphia, Penn.: I have reached the same conclusions as the authors with respect to the amounts of spinal fluid to be used in making the Wassermann test. In my earlier work I stated that .4, .6 and .8 were routinely employed, but series of observations led me to the conclusion that larger amounts are necessary, and for two years I have used routinely 3 tubes containing $\frac{1}{2}$ c.c., 1 c.c. and $1\frac{1}{2}$ c.c., respectively. Occasionally only the largest amount will yield a positive result, the others being negative. In paresis, however, it is the rule to find all three tubes positive. In every instance, I not only made a Wassermann on the spinal fluid but counted the cells, did a Nonne, Noguchi, Fehling's and gold Sol test. With regard to the count, I wish to refer to the very interesting work of Dr. Paul Weston of the Warren State Hospital, Pennsylvania, who made a very large number of counts and found that they varied day by day and without any apparent reason. So striking was this that Dr. Weston was led to the conclusion that counting the cells was of no practical value. In all instances, Dr. Weston's counts were made within a few minutes of taking the spinal fluid, so that no opportunity for cytolysis was given. I have had no opportunity to make such daily studies of the cell counts, but in my experience there was always a direct relationship between the degree of pleocytosis and the protein content of the spinal fluid. As to the gold sol, though the preparation of the solution was extremely difficult, the application of the test was very simple and the results of considerable value, not alone in suspected cases of syphilis, but in disease of the brain and cord or their coverings, whether of a primary or secondary nature. For instance, in uremia one finds almost constantly that the first tube will go down completely while the others remain unchanged, or but so slightly changed as to be of no special moment. In one instance with a negative Wassermann both in the blood and spinal fluid, with a low cell count, an absent Nonne and Noguchi and reduced Fehling's, tube number five became water clear, while all the rest remained unchanged. In genuinely specific cases the Gold Sol reaction is a variable one; for instance in advanced cases of paresis and tabes, all of the ten tubes which we employ in our series may become water clear. Speaking very generally, we have usually found that the curve of paresis is more apt to be irregular, the first two or three tubes being water clear, then two or three tubes of variable color, while perhaps 6 and 7 may again be water clear with little or no change in the last two or three. In the tabetics of the less advanced type the earlier changes will be slight, while tubes 4, 5 and 6 will often be water clear and perhaps the rest of the series water clear. In one case of gumma of the brain the first two tubes were slightly changed, while the remainder from the 3rd to the 10th were all water clear. In one case of multiple sclerosis in which the spinal fluid was under considerable pressure, as is usual in this type of case, there was a negative Wassermann both in the blood serum and in the spinal fluid, with a very slightly increased cell count, with a slightly positive Nonne and Noguchi, Fehling's reduced, and the Gold Sol showed no change in the first six tubes, slightly progressive change in the 7th and 8th, while the 9th and 10th were water clear.

We do not feel that our own work has been sufficiently extensive to enable us to draw definite con-

clusions upon the value of the Gold Sol reaction, but one thing we can state most positively, and that is, that the character of the curve varies materially with the improvement or retrogression of any particular case, and in two instances in which we had positive Wassermann reactions in cases of tabes, with marked Gold Sol reactions, when the patients improved clinically and the Wassermann reactions became negative, the Gold Sol likewise became negative.

Dr. GEORGE P. SANBORN, Boston, Mass.: We have made about 200 observations, and in paresis we have obtained from the analysis of the cerebrospinal fluid exactly what was obtained at the Johns Hopkins Hospital in Baltimore in tabes. In tabes we have never gotten tubes that were absolutely decolorized. In the suspected cases which gave the clinical signs of tabes and those alone, the tubes were decolorized in the first three or four days; but in these cases the nerve infection was very extensive, more so than even the clinical diagnosis suggested. In other words there may have been a paretic element in the case.

We also found that after the injection of the salvarsanized serum in a number of cases the intensity of the gold reaction diminished with the successive treatments. In some instances from three to four days. I have never yet seen a case of tabes in which we could not get any definite decolorization in one tube and an ordinary growth in the rest of the tubes.

Dr. RICHARD DEXTER, Cleveland, Ohio: The use of small doses I believe to be admirable in the treatment of such cases; one can see the reaction diminish under such a treatment, and I believe it is well to continue the treatment with these small doses made of a definite titration.

With regard to the so-called typical curve occurring in tabes, in Germany as well as in America, also in other countries, there has been described the typical curve.

(To be continued.)

Harvard Medical School.

PRESENT USES OF X-RAY.*

I. THE PHYSICAL CHARACTERISTICS OF THE X-RAY.

DR. H. W. VAN ALLEN of Springfield, Mass.

Origin. When an electric current of high voltage is passed between two points through a relatively high vacuum, there takes place from one of the points (kathode) a discharge of electrically charged gaseous particles known as the kathode stream. In an ordinary tube the vacuum is not very high and the kathode stream is composed of streams of luminous gas particles, giving off a peculiar glow. In tubes of higher exhaustion there is simply a fluorescence to be seen on the walls of the tube.

The kathode stream produces x-rays when it comes in contact with any substance which stops its progress, and the x-rays so produced vary in quality according to three factors: (a) The voltage of the current and therefore the velocity of the bombarding kathode stream; (b) The character of

* Lectures at the Harvard Medical School on January 7, 1916.

the gas; (c) The atomic weight of the target or substance impinged upon. The variation in the quality of x-rays must be recognized as being very wide—comparable to the variation in color—and is of great importance therapeutically.

The Soft Tube. When the vacuum in the tube is less perfect it is called a soft tube. The x-rays produced are more caustic in their superficial action, have less penetrative ability and have less selective influence on certain types of body cells. Tubes may also be made softer in action by employing a current of lower voltage. Tubes become soft anyhow in course of time. And since soft tubes are more caustic superficially and valueless for deep penetration, you are here distinctly warned against buying x-ray machines of low voltage, the cheap "portable outfit" which are dangerous as well as inadequate. Soft tubes make more time necessary in fluoroscopic work, and, hence, expose the patient and operator to burns. Soft tubes may stimulate a superficial neoplastic growth where a hard tube by reason of its selective influence would destroy the growth.

Hard Tubes in which the exhaustion is more complete require higher voltage and give rays of shorter wave-length, greater penetration and a more distinct selective destructive action on certain types of cells.

Coolidge Tubes represent a great advance in roentgenology because of the fact that they are more constant in their action. The cathode stream in the Coolidge tube consists of vaporized tungsten, and the greater atomic weight of the tungsten target, together with the increased voltage which the tube is capable of standing, produces rays of very greatly increased hardness, of constant and controllable hardness, and much greater penetrative power. It must be emphasized that experience with the Coolidge tube is not yet adequate for us to say what its chronic effects may be. We should use the greatest caution in using the Coolidge tube because of its great power.

Measurement of x-rays is more important now that the Coolidge tube has come into general use. Hansmann's radiometer is of value, and depends on color changes effected (by ionization probably) on card board plaques of barium platinocyanide.

The use of filters depends on the fact that x-rays are produced in mixtures of hard and soft, and, therefore, if the hard rays are to be applied long enough to be effective in deep penetration, the soft rays must be removed or serious superficial burns would result. Aluminum 1-3 mm. in thickness is used as a screen. As x-rays may produce secondary rays whenever they are stopped, a secondary screen of sole leather is used beneath the aluminum.

The application of the x-rays contains many mechanical and mathematical problems. The intensity in the effect of the x-rays varies inversely as the square of the distance at which they are applied. By application of the constant hard rays of the Coolidge tube over different two-inch squares on the abdomen, each application being directed toward a given locus, e. g., a myoma of the uterus, it is possible to give the deep structure far more treatment than would be possible from an application over a single area. This method of application is called cross-fire.

The effect of x-rays on cell life is two-fold: first stimulatory, second and subsequent, destructive. Plants treated with x-rays grow better than unexposed controls,—but, if subjected to prolonged

treatment, die. More than 36 hours of x-ray exposure results in irregularities and abnormalities of growth in the chick embryo. Though it is well known that x-ray operators have in many cases become sterile, it is not so generally known that in the neighborhood of one-third of the offspring of x-ray workers have congenital anomalies of structure. Rapidly growing cells are most sensitive to x-ray influence; lymphoid tissue, cartilage, vascular endothelium and spermatocytes being notably non-resistant. Cells behave differently at different times and thus often repeated small doses may be more effective than massive dosage. The x-ray burns are serious because proper regeneration is greatly delayed. Other tissues suffer severely also. Burns may last ten years or more.

In medical treatment x-ray applications are of service in many conditions, of which the following are examples:

Psoriasis.—The lesions do not have to be exposed directly to the x-rays. Treatment applied to back and thighs has been followed by complete recovery of severe psoriasis of the scalp.

Leukemia.—Cases have been improved by large doses of x-ray.

Secondary Anæmia.—Cases improve with small doses, given as stimulant.

Tuberculous Adenitis.

Hyperhidrosis.

Acne.—Especially the acne of early maturity, when freedom from acne on the face is especially welcomed by the patient.

Superficial Epitheliomata are especially adapted to x-ray treatment. Eighty-five per cent may be cured. Warts also are very well adapted for x-ray removal.

Experiments on mice have shown that previous x-ray exposure markedly discouraged the growth of repeated transplants of tumors. There is, therefore, a question whether x-ray treatment before operation for carcinoma would not help to prevent "surgical transplants" during the operation, and recurrence in the scar.

II. THE VALUE OF X-RAY IN DIAGNOSIS.

DR. L. G. COLE of New York.

The value of the x-ray in diagnosis depends on the clearness of the plates and on the judgment and experience of the interpreter. In considering the factors which improve the clearness of the plate we must note that the direct rays come from the focal point on the anode and pass in all directions from it, and, when strong, give a good picture. The indirect rays come from many points on the wall of the tube and therefore blur the shadows cast from the anodal focal point and make the picture foggy. Both direct and indirect rays on striking the tissue give rise to secondary rays which further befog the picture.

To review in barest outline, we shall consider the following topics. (Slides were shown to illustrate the subjects).

1. Foreign Bodies. The x-ray will show any object possessing greater or less density than body tissues. Metal markers on the surface are of great value in localization of the foreign object. The depth of a foreign body may be calculated by taking two plates at two different known angles and comparing the positions of the shadow.
2. Fractures (a) Radiographs should be made when you don't think you have a fracture.

Dislodged fragments around joints and long, oblique fractures will be missed unless plates be taken.

(b) Radiographs should be made where there is no question of fracture but of position. In New York law if a doctor fails to advise x-ray plate where there is proven to be fracture and it is possible to have the plate made, he is legally responsible.

3. Anomalies—Cervical ribs, etc.
4. Bone Lesions—Sarcoma of the elbow, destruction of ilium by hypernephroma, tuberculosis of hip joint, epiphysis where the roentgen findings may precede any clinical symptoms, tuberculosis sicca of shoulder joint shown as examples.
5. Abnormal closures of intervertebral foramina with pressure symptoms referred to periphery.
6. Sinus, tumors of sella turcica, teeth, cysts of jaw and other head conditions.
7. Stone in kidney, ureter and bladder.
8. Chest Lesions. Roentgen findings are to be depended on, even in the absence of clinical symptoms, and negative roentgen findings are to be depended on even against clinical signs. Cole advocated, in 1906, talking in terms of the number of miliary tubercles seen at various times in the course of a case. Clinical experience has borne out the value of this procedure. Tubercles will show when dullness will not be present. Training in interpretation is of great importance in roentgenology of thoracic contents.
9. Gastro-Intestinal. Here the utmost thoroughness and experience are necessary. For a complete gastro-intestinal examination, 60 plates are taken by the speaker. No diagnosis should be made on gastro-duodenal cases from less than 40 plates. These plates should be taken as routine and studied as a complete series after all have been taken.

X-ray shows normal stomach to go through repeated complete cycles of systole and diastole. During systole, food is squirted into the cap, not occasionally, but on every peristaltic contraction. The cap is emptied by the duodenal mechanism, and the sphincter, therefore, does not mark the limit of the physiological stomach. The reaction in the cap is acid; embryologically and histologically the cap belongs to the stomach and it is here that the finishing touches of protein digestion begin in the stomach take place. Ninety-eight per cent. of the duodenal ulcers are found here by the surgeon.

Roentgen evidence of carcinoma has the "finger and thumb imprint" as its most characteristic sign. This peculiar form of constriction is constant in the different plates. The majority of carcinomas show normal duodenal caps.

Roentgen evidence of ulcer includes the deformity of the cap, the presence of a clearly outlined crater, and irregularity in the rugae and in the progress of peristalsis.

Roentgen diagnosis is far too accurate a method of diagnosis to be regarded as a mere accessory. Careful study in the interpretation of a good series of gastro-intestinal plates will give 90-100% accuracy in diagnosis without the help of any other clinical procedure.

R. W. LOVETT, M.D.
ALAN GREGG, A.B.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL.

TUESDAY EVENING, JANUARY 11, 1916, 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, president, in the chair.

EXHIBITION OF CASES.

DR. CHRISTIAN: A patient with a large intrathoracic dermoid cyst.

Paper of DR. W. B. CANNON and MR. McKEEN CATTELL:

SOME CONDITIONS CONTROLLING THYROID ACTIVITY.

It has been known for a long time that the activities of tissues are manifested by electrical changes. In 1885 Davis and Bradford made observations of this nature on the salivary glands. Later in the nineties further studies were reported on the glands of the gastric wall. These represent, as far as is known, the only investigations of such electrical changes on the glands within the body.

Use has been made of this method (with a string galvanometer) in ascertaining the activity of the thyroid gland. First, however, a gland with an external secretion—the salivary glands—was tested as a control. From a series of experiments it became clear that the electrical changes noted are in reality the result of the secretion of the gland.

In such studies as these a knowledge of the innervation of the thyroid gland is of the greatest importance. It was finally shown by means of stimulation experiments that the sympathetic system is a controlling factor in regulating thyroid activity. Adrenalin, which is a stimulant of the sympathetic system, has been found to cause quite remarkable action currents. Pilocarpin, on the other hand, brought about no appreciable change in thyroid activity. Pilocarpin stimulates the autonomic system, hence it is the sympathetic and not the autonomic supply which controls thyroid activity.

From experiments conducted with pituitrin it appears that these action currents, and therefore the thyroid secretion, are due, not to vasoconstriction and anemia, as one might suspect from the use of adrenalin, but to impulses entering the gland cells through nerve fibers.

The splanchnic nerve when stimulated leads to a discharge of adrenalin from the suprarenal glands. When the splanchnic is stimulated and note is taken of the action currents in the thyroid, curves are obtained which show a secretion in the thyroid gland.

This work represents the first demonstration of an interrelation between the glands of internal secretion. It seems probable that the thyroid has a function connected with the function of the sympathetic system. The emergency function of the thyroid may be one correlated with the periods of demand for great activity. It may be stirred up, then, at such times so that it leads to an acceleration of the activities of other glands.

DISCUSSION.

DR. CUSHING: Dr. Cannon, in this very clear and interesting exposition of a small part of his work, has opened up a new field which may serve to deter-

mine the interrelations of the whole system of internal glands. We now begin to understand through the study of the neurogenic supply of the thyroid gland that fright may really be an etiological factor in the development of exophthalmic goitre, as clinicians have often supposed.

Paper of Drs. A. FORBES and R. H. MILLER:

DETECTION OF AFFERENT IMPULSES IN THE BRAIN STEM AND THEIR ABOLITION WITH ETHER ANESTHESIA IN RELATION TO THE THEORY OF ANOCI-ASSOCIATION.

Crile has asserted that ether does not serve to protect the brain from afferent impulses. The experiments reported tonight were undertaken to confirm or to disprove this hypothesis.

Records were made of action currents in the afferent nerve fibers by means of a string galvanometer.

Control experiments were first necessary to show that action currents in the nerve fibers directly stimulated were not abolished by profound anesthesia. Last spring we found that profound anesthesia which does not interfere with respiration did not abolish the action currents in such nerves.

Since some afferent neurones extend as far forward as the medulla, it was necessary to work centralward to this region. It was also desirable to have preparations which could be studied alternately with and without anesthesia. Accordingly, decerebrate animals were used with the transection made back of the optic thalamus at the anterior edge of the anterior corpora quadrigemina. This gave a maximum length of the second chain of neurones consistent with motionless decerebrate rigidity.

The stimulating current was applied to an afferent, peripheral nerve,—the sciatic. The non-polarizable electrodes of a string galvanometer were connected with the brain, one on the dorsal aspect of the brain stem and another at the bottom.

The results demonstrated that moderate surgical anesthesia abolishes one of the two forms of curve obtained without it. This probably represents the action current in the central neurones. It takes place about the time the flexion reflex disappears, which is long before the ether is deep enough to interfere with the respirations. Hence ether is to a considerable extent effective in protecting the cortex from peripheral stimuli.

DISCUSSION.

DR. CHRISTIAN: This work of Drs. Forbes and Miller is of great importance to the surgeon as well as to the physiologist. It seems to afford a definite demonstration that ether definitely blocks afferent impulses. If this be true, our present views on anoci-association are not very secure.

DR. CUSHING: This is a very important and interesting communication to us all. Dr. Crile's estimate of such effects, however, is based on changes in the cells of the cerebellum. Dr. Forbes, I believe, has not yet studied the action currents in that part.

DR. CANNON: Nerve cell changes are subject to great personal variations. I have had occasion to observe this in some personal work. I have also seen the preparations of Dr. Crile, and alongside of the faded cells there are well-colored, normal appearing cells. Dr. Allen has recently induced shock in animals, and has not obtained similar results to Dr. Crile. Because of the unreliable results, of the lack of confirmation, and from Dr. Forbes' results, I

believe that ether does to afferent impulses what it does to efferent impulses.

DR. BOOTHBY: Such studies as Dr. Forbes has made should be carried on with ether under known vapor tensions.

ERNEST G. GRAY, M.D.

Book Reviews.

Publications from the Jefferson Medical College and Hospital. Vol. VI. Philadelphia.

The Jefferson Medical College has published in book form a series of original articles by various members of its staff. The volume contains eighteen articles which, unlike those appearing in Vols. I, II and III, have not been previously published. The volume is well illustrated. Several articles written particularly about laboratory equipment and museum appliances are full of suggestions. Of the value and interest of its scientific papers there can be no question.

Encyclopedias Medicina. Second edition, under the general editorship of J. W. BALLANTYNE, M.D., C.N., F.R.C.P. Vol. II. Edinburgh and London: W. Green and Son, Ltd. 1915.

The first volume of this standard medical encyclopedia was reviewed in the issue of the JOURNAL for September 9 (Vol. clxxii, page 397). The present volume continues the work through the captions from aspiration pneumonia to chlorodyne. The separate articles by various well known authors or revisers are frequently illustrated with text cuts. The volume continues the important and valuable work already so satisfactorily begun.

Cancer, Its Study and Prevention. By HOWARD CANNING TAYLOR, M.D. Philadelphia and New York. Lea and Febiger. 1915.

In the issue of the JOURNAL for May 20, 1915 (Vol. clxii, page 755), we reviewed Dr. Bainbridge's elaborate work on "The Cancer Problem." Dr. Taylor's volume presents a more compact study of the same problem, particularly from the clinical point of view, with reference to the diffusion of knowledge about the early signs and symptoms of the various forms of cancer and to the promotion of its early recognition and treatment. Emphasis is also placed upon the predisposing causes of cancer, that they may be avoided. At the conclusion of each chapter is a brief bibliography of references to important recent literature upon the subject concerned. The volume is hardly written for the laity but should prove of value and interest to the profession.

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THE RESPONSIBILITY FOR DIABETIC COMA.

DURING the past year our knowledge of diabetes has progressed in a remarkable manner. Science moves, not always slowly, but sometimes by leaps and bounds. Heretofore we have looked upon diabetes as a rather mysterious malady, condemning its victims to a rigid, almost penitential diet, with the alternative of a speedy demise, accompanied often by such adjuncts as carbuncle and gangrene, culminating in a fatal coma. The disease has been rather a nursing than a therapeutic problem.

From the work of Dr. Allen¹ and others, we are beginning to realize, however, that diabetes is amenable to treatment and that there is an avenue of intelligent attack available for the physician. He appears to have been the first to evolve the theory that part of the clinical picture of severe cases of diabetes might be due to a toxemia rather than inanition, and following up

¹The Treatment of Diabetes. By F. M. Allen, M.D. BOSTON MED. AND SURG. JOURN., 1915, Vol. 172, p. 241.

this theory, to try fasting, first on animals and later on human beings.

Although of course this method is too recent as yet to be dogmatic about it, the results seem promising so far. It should not, however, be a question of a very long time before we are able to see just how far this method surpasses the ordinary symptomatic and dietetic treatment, as the course of the disease under this latter method was sometimes comparatively short.

The distinctive feature of Dr. Allen's method is the length of the initial fast. In the October number of the *American Journal of Medical Sciences* he outlines his treatment. The initial fast, he says, must be lengthy enough to render the urine sugar-free, and is sometimes eight or ten days. After this preliminary ordeal, feeding is resumed gradually, and the patient's tolerance for carbohydrates, fats and protein determined. Routine fast days once a week are advisable. Alcohol may be given in small quantities, even during the initial fast. The danger signals of the fasting patient are vomiting and prostration. Dr. Allen has come to the conclusion that this treatment removes glycosuria and acidosis more quickly and surely than has been the experience heretofore.

In the same number of the above-quoted magazine is a confirmation of Dr. Allen's conclusions by Dr. E. P. Joslin,² who has found the treatment eminently successful in his own cases, and who believes that it can be carried out at home, provided the family and friends can be properly educated. Dr. Joslin suggests that the physician instruct the patient in the test for sugar and allow him to examine his urine from time to time, thus giving warning in time to save the patient from complications.

Certainly if patients are thus instructed, we should be able, theoretically at least, to prevent absolutely that dread denouement, diabetic coma. Of course there may be cases of rapidly developing diabetes, where the patient does not suspect that there is anything wrong with him, and, as he does not seek medical advice, may lapse into coma before his condition is suspected. But, given a patient who has sought treatment and been relieved of his glycosuria, we should consider it a reflection on the physician, supposing, of course, that the new treatment proves to be all that it promises, if any diabetic cases develop coma.

²Present-Day Treatment and Prognosis in Diabetes. By Elliott P. Joslin, M.D. Amer. Jour. of Med. Sci., October, 1915.

BOSTON CITY HOSPITAL ALUMNI ASSOCIATION.

It is always of great value to any hospital to retain in after years the loyalty and interests of its alumni. Graduate house-officers and nurses, returning, from year to year, to the institution where they have received their most important training, not only thus keep in touch with progress in medical science and hospital administration, but bring back a new stimulus from the world without. Incidentally, becoming acquainted thus with the hospital's needs, they may be able to help, or to procure help, to meet these wants.

The Boston City Hospital, among others, is to be congratulated for the efficiency with which it has secured the interested loyalty of its former house-officers through the Alumni Association, and the Nurses' Club. The annual meetings of the Association have always been a source of pleasure to those who attend, and of mutual profit to them and the Hospital.

This year, the president of the Association, Dr. Robert W. Lovett, is making a definite effort to increase even further the value of this meeting to all concerned, and to give the Association an even wider function in promoting the interests of the Hospital.

"The first step toward such an expansion would naturally be in a better knowledge of the hospital, its work and its wants, and the program for this year will make a definite move in this direction. This matter is in charge of a committee of the staff working with Dr. Dowling, the superintendent.

"The meeting will be held on February 23, 1916. In the morning, exercises will be held at the hospital, consisting of talks on clinical subjects and accounts of progress in various lines. Operations will not form a prominent part of the program, but will probably be going on at the same time for those who wish to see them. The usual lunch will be held at the hospital at noon. In the early afternoon the newer parts of the hospital will be shown and the work presented by the administration, and probably certain scientific demonstrations will be presented, as well. Dinner will be at the usual time, and it is hoped that the after-dinner speakers invited may prove attractive.

"The society of the alumni has a function to perform, and was formed not only as a social organization, but to be of use to the hospital. The Executive Committee confidently looks for the coöperation of the majority of the members in helping it to make the Association a more active one and to show their willingness to aid by attending the dinner."

The JOURNAL takes cordial pleasure in extending to the City Hospital and to the Alumni Association its sincere good wishes, not only for the success of this meeting, but for the continued and increasingly helpful assistance and support of the Hospital by its graduates.

PERRIN, OF GRENOBLE.

Nor all the deeds of bravery are consummated in the heat and fury of actual conflict with the enemy, nor are all the heroes fighting men. Here and there among the vast, but unexploited army of physicians and nurses, there come to light stirring examples of heroism.

Now and then, casually and incidentally as it were, we hear a brief report of one of these heroes of the healing art,—a few lines only, more a tale of tireless effort and supreme self-sacrifice than of spectacular daring, and consequently less suited for the story-teller, but between them we may read, if we will, something of the deed behind. Such is the tale of Perrin, of Grenoble. He was a medical student at the University of Paris when the war broke out, and was to have received his degree the following year; but with the first call to arms he hastened to give his services to his country. In the year which followed he was mentioned in the army orders for bravery, and received the Military Medal and Cross. He also found himself a patient, with shell wounds in the legs. Nothing daunted, he had himself propped up in bed and wrote his doctor's thesis—it was on shell wounds, and Case No. 57 was himself! The thesis was accepted by the University, and as soon as he recovered he received his degree. In presenting it to him, President Landouzy recalled the interesting circumstance that his own grandfather had received the same degree under very similar conditions, except that at that time Paris was in the hands of her enemies.

BOSTON MEDICAL LIBRARY.

THE Fortieth Annual Report, presented at the annual meeting on January 11, 1916, gives many interesting facts relating to the progress of the Library. On account of the war, there was a great falling off in the number of foreign

books and journals received. Last year over \$3300 were expended for periodicals, but this year it was hard work to spend \$1700, in spite of adding eleven new subscriptions to the list. This came from the fact that seventy-six foreign journals were not received, having suspended publication, temporarily at least, and many others have appeared, straggling along at very infrequent and irregular intervals.

The Library has received during the year, from the bequest of the late Miss Ellen Brewer Wyman, of Newburyport, nearly \$70,000, half of the income to be used for the purchase of books and the other half for the binding of periodicals. This latter has been of great service in permitting the binding of a large number of periodicals which had been accumulating from lack of funds to bind them.

From the John M. Harlow estate have been received about \$3500, the income to be used for the purchase of books.

The income of the Library for the year was \$21,900, and there were expended for books \$2508, for periodicals \$1696, for binding \$2678, and for completion of files \$438.

The Librarian enumerated a long list of the notable accessions and gifts which had been received. Dr. J. B. Ayer gave two framed oil paintings by Darius Cobb of the site of the Library in 1881, showing a few miserable hovels and the water of the Back Bay coming up almost to them. Dr. E. P. Joslin presented to the Library last April the very valuable collection of works on diabetes which he had placed there on deposit several years ago. Mrs. J. H. Means donated the very complete library on color blindness which had belonged to her father, the late Dr. B. Joy Jeffries. Dr. W. D. Hall was the donor of a very large and valuable collection of ophthalmological journals. From Dr. F. H. Williams was received a book in wooden covers by Jacobus de Dondis Paduanus, *Aggregatio Medicamentorum*, Strassburg, Jean Menetelin, about 1470, the oldest printed book in the Library. Another valuable book acquired was a very handsomely bound copy of the work by Sir J. Fayrer on *The Thanatophidia*, a description of the venomous snakes of India, with medical details and experiments.

In the rooms recently vacated by the Directory for Nurses there have been placed steel stacks, with room for nearly 12,000 periodical volumes and theses. The former office of the Nurses' Directory has been fitted up as a room

for the Librarian, who has waited forty years for a place and a desk that he could call his own.

There were added to the Library during the year 3688 volumes, making a total of 89,963 volumes. The growth of the Library since its beginning in 1875 is shown in the following table, giving the figures at five-year intervals.

| |
|-----------------------|
| 1876, 4488 volumes. |
| 1881, 10,123 volumes. |
| 1885, 15,162 volumes. |
| 1890, 20,593 volumes. |
| 1895, 26,082 volumes |
| 1899, 31,688 volumes. |
| 1905, 45,194 volumes. |
| 1910, 68,890 volumes. |
| 1915, 85,963 volumes. |

The Library still holds the fourth place in size in this country, being exceeded only by the Surgeon-General's Library of Washington, the College of Physicians of Philadelphia, and the New York Academy of Medicine.

There has, hitherto, been a great lack of uniformity among medical libraries in their methods of compiling statistics, and it has been impossible to know how to interpret figures given in the annual reports in many cases. To bring about a uniform system, a set of recommendations was adopted by the Medical Library Association at its meeting in Washington in May, 1915, following a paper by Mr. James F. Ballard, urging the adoption by all medical libraries of a uniform method of preparing statistics. The following are some of the details of the system advised:

"Everything of over 100 pages is a volume; everything of any size, if bound, is a volume; everything under 100 pages, if unbound, is a pamphlet. Duplicates are not to be counted, except second copies of books in general use and merged in the general library. Uncatalogued and unaccessioned material, merely estimated lots, also incomplete and unbound periodicals must not be included."

This system has always been in use by the Boston Medical Library in compiling its statistics.

After forty years of growth and service to the public, the Library finds that it has entirely outgrown the capacity of its bookstacks and its periodical room, and is greatly embarrassed in its endeavor to care for the books and journals

as they are received. Most of the money at its disposal is restricted in the purpose to which it can be used, so that none is available for a new stack-building. This is a capital opportunity for the friends of medical education to contribute to an institution which has proved its worth and offers its resources freely to the whole community.

THE TRUDEAU SCHOOL OF TUBERCULOSIS.

THE recent lamented death of Dr. Trudeau gives particular appropriateness to the notice, published in another column of this issue of the JOURNAL, of the establishment of a series of courses in the advanced study of tuberculosis in the Adirondack Cottage Sanatorium which he founded at Saranac Lake. These courses will be given there in the New York State Sanatorium at Raybrook and in association with the Saranac Laboratory and other neighboring hospitals and sanatoria. Courses will be of six weeks' duration and will cover all phases of the subject. Attention is called to this notice and to the importance of the opportunity which these courses offer for special advance study in this most important department of medicine. The announcement of the Trudeau School of Tuberculosis is encouraging evidence that the work so brilliantly founded by Dr. Trudeau will be adequately and progressively carried forward by his efficient successors.

MEDICAL NOTES.

PREVALENCE OF POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for January 7, 1916, states that during the month of November, 1915, there were in Virginia, sixteen cases of poliomyelitis, 43 of smallpox, and 378 of typhoid fever. During the same period there were 12 cases of poliomyelitis and 80 of typhoid fever in California; there were 171 cases of smallpox in Iowa and 138 of typhoid in Texas.

RELATIVE DEATH RATES FROM WAR AND FROM DISEASE.—The recently published 71st annual report of the New York Life Insurance Company shows that during the past year 409 of its policy holders were killed in battle, 448 by acci-

dents in civil life, while 707 died of cancer, 772 of pneumonia and 950 of tuberculosis.

THE TRUDEAU SCHOOL OF TUBERCULOSIS.—Recent advances in the knowledge of tuberculosis have created a demand for opportunities for special advanced study in this department of medicine. Such study requires institutions, laboratories, and other agencies devoted to the investigation and management of this disease.

In response to an extensive and increasing demand, and by the generous aid of public spirited persons, it has been decided to offer courses in the advanced study of tuberculosis at Saranac Lake in the Trudeau Sanatorium (Adirondack Cottage Sanitarium), founded by Dr. E. L. Trudeau in 1884, and the near-by New York State Sanatorium at Raybrook, and in association with the Saranac Laboratory, the Reception Hospital and the Sisters' Hospital at Saranac Lake, as well as the Stony Wold Sanatorium.

A six weeks' course will be offered covering all phases of the subject, including laboratory, clinical, and x-ray diagnosis, institutional organization, management and treatment, besides laboratory research.

The first session will be held from May 17, 1916, to June 27, 1916. Others will follow at convenient times. The fees for the course will be \$100, with an additional \$10 for laboratory expenses. It is expected that scholarships will be provided for a limited number of students. The total expenses, including board and lodging, will range from \$200 to \$250.

A prospectus and schedule of the course of study can be obtained from the Secretary, Saranac Lake, N. Y.

ELECTION OF DR. HUNT.—It is announced that Dr. Reid Hunt, professor of pharmacology at the Harvard Medical School, has been elected president of the American Society for Pharmacology and Experimental Therapeutics.

GRIP AND PNEUMONIA STILL CAUSING A HIGH DEATH RATE IN NEW YORK CITY.—During the past week 85 persons died of grip, as compared with 10 during the corresponding week of 1915. Since the mortality of grip *per se* is low, it is impossible to estimate the number of cases of this disease that occurred during the week. Since the number of deaths is eight times as numerous as during the corresponding week of last year, the number of cases was undoubtedly very large. Four hundred sixty-six persons died of bronchitis and pneumonia, as compared with 347 during the first week of 1915. Heart disease and nephritis show an increased mortality of 34. Undoubtedly, some of these deaths were hastened by "colds" recently contracted.

So far as grip, pneumonia and bronchitis are concerned, the following table, showing the deaths from these causes during the past four weeks, is of interest:

| Deaths From | Week Ending | | | |
|-----------------------|-------------|---------|--------|--------|
| | Dec. 18 | Dec. 25 | Jan. 1 | Jan. 8 |
| Influenza | 12 | 24 | 74 | 85 |
| Bronchitis | 18 | 36 | 29 | 25 |
| Lobar pneumonia | 185 | 251 | 272 | 293 |
| Total | 215 | 311 | 375 | 403 |

Viewed from the standpoint of age distribution, the deaths last week were more numerous during the later periods of life than during the earlier years. The total number of deaths reported during the week was 1880, giving a rate of 17.08, as compared with 1714 deaths reported during the corresponding week of 1915, with a rate of 16.01. The difference of 1.07 in the weekly rate is equivalent to an increase of 118 deaths.

INFANT MORTALITY IN ENGLAND.—A report of the health department of the county borough of Huddersfield, England, contains some interesting information regarding birth and infant mortality rates in that district. For the past fourteen years special efforts have been made to lower the infant mortality rate, with the result that in these years the rate was 30% lower than in the years 1877-1904. The measures in Huddersfield may be appreciated by the general statement that diarrhea is one of the minor causes of death, with equal figures in measles and whooping cough, while the major causes are premature birth, bronchitis, pneumonia and marasmus and debility, there being half as many deaths from the minor causes as from the three last-named major causes. There is in this active district the usual falling off in the birth rate, the actual number of births registered in 1912 being 600 less than it was in 1872, when the population was only seven-tenths as great. The rate, therefore, has greatly declined, being for the successive tenth years between 1872 and 1912, 37.5, 30.8, 23.3, 24 and 18.8. During the year 1914 the birth-rate kept on its downward way, touching the figure 18.08.

TYPHOID FEVER REDUCED IN RURAL COMMUNITIES.—Reduction in typhoid fever and improvement in sanitary conditions have followed the intensive investigations of rural communities, carried on by the United States Public Health Service in coöperation with local and state health officers, according to the annual report of the Surgeon-General of that Service. During the past fiscal year 16,369 rural homes in eight different states were visited and many of them revisited. In each of these homes information was obtained as to the prevalence of disease and insanitary conditions, and a complete sanitary survey of the premises conducted. This was followed by re-inspections to determine if remedial measures had been instituted. In but a relatively small percentage of the cases did the persons concerned, after having their attention drawn to the danger of a particular unhygienic condition, fail to inaugurate corrective measures. Stimulus was given to the work by means

of public lectures, the formation of active sanitary organizations, and the enlisting of all public-spirited citizens in the campaigns for reform. Public buildings were also inspected and local authorities given expert advice in solving such sanitary problems as the disposal of excreta, the prevention of soil pollution, and the maintenance of pure water supplies.

The surveys made during the year 1914 had shown that in rural communities less than one per cent. of the homes had sanitary toilets and that more than fifty per cent. of the people were using water from polluted sources. This condition, according to the Public Health Service, made the rural sanitation question loom large among the matters vitally affecting the welfare of the nation. Following these studies and as a result of the interest aroused, the typhoid fever rate, an excellent indicator of the sanitary status of a community, has in some places frequently been cut to one-quarter of its previous figure. In Berkeley County, West Virginia, the cases of typhoid fever were reduced from 249 to 40 in one year. In Orange County, North Carolina, the rural sanitation campaign resulted in a reduction of the cases from 59 to 17.

The tangible results of operations in rural sanitation indicate that marked advancement in maintaining hygienic and satisfactory surroundings in country districts is possible by the application of the common principles of preventive medicine. Insanitary conditions exist largely because they are not known to be such. Actual demonstrations of their harmfulness, together with definite recommendations for their correction, remain one of the most gratifying and successful methods for instituting reforms, and have been, in the experience of the Public Health Service, invariably accompanied by definite and measurable results.

EUROPEAN WAR NOTES.

CASUALTIES AMONG GERMAN MEDICAL OFFICERS.—Report from Budapest, Hungary, on January 14 states that during the period from August 1, 1914, to November 1, 1915, 373 German army surgeons were wounded, 96 killed on the field of battle, 707 died of infectious diseases, chiefly Asiatic cholera and typhus fever, and 315 were taken prisoners. Of Austrian army surgeons, 315 were wounded, 101 killed, 971 died of infectious diseases, and 331 were taken prisoners.

NEED OF SERBIAN RELIEF.—The Serbian Relief Fund Committee has recently issued the following appeal, describing the need for relief in Serbia and urging contributions to its fund for that purpose:

"Thousands of Serbian refugees are homeless in Greece; other thousands have been driven into the mountains of Albania and Montenegro. Those Serbian women and children who did not flee before the invasion are undergoing great

privation and suffering in the conquered territory. We are again asking for contributions for the relief of Serbia—this time to save the Serbian refugees. We also desire to render an account of our stewardship and inform you on the situation.

"Dr. Edward Stuart is distributing relief from Salonica, and to this work we have contributed \$25,000, of which \$10,000 cash was cabled to him as an emergency fund and the balance expended for supplies, partly now on the way and partly, we believe, already delivered, having been purchased and shipped from England when cargo space could not be secured in this country. For the relief of the refugees in Albania and Montenegro a most efficient American committee has been formed in Rome, including Ambassador Thomas Nelson Page, Dr. Edward W. Ryan, (Red Cross), Mr. F. C. Wolcott (Rockefeller Foundation), and Mr. H. O. Beatty (War Relief Clearing House). This American committee is shipping supplies from Italy to Albania, and distributing them to the Serbian refugees. To this work we have contributed \$16,500.

"Mr. Herbert C. Hoover is negotiating with the German-Austrian Governments and those of the Entente Allies for relief to be sent into Serbia itself under conditions which will guarantee that, as in Belgium, supplies will not be appropriated by the invading armies. It is expected that arrangements for this work will soon be completed.

"The above expenditures, added to the expenditures for supplies last spring and \$6000 to assist the work of Dr. Strong have exhausted the \$60,000 so liberally contributed by the people of New England. In all our expenditures for relief we have been in active coöperation with the Rockefeller Foundation, War Relief Clearing House, Serbian Relief Committee of New York, Serbian Relief Committee of London, and the American Red Cross. We have thus been enabled not only to ship supplies promptly both from New York and London in response to the great emergency that arose when it was difficult to obtain cargo space, but also to obtain all the information available regarding the complicated situation through the various agents of these organizations in Serbia and Greece, assisted by the State Department at Washington. The difficulties of getting relief to Serbia have been great, but we believe that through co-operation we have been able to meet them promptly and give substantial help.

"We now appeal for more money—much more money. No contribution will be too small to do good; none can be so large as to make other contributions unnecessary."

WAR RELIEF FUNDS.—On January 22 the totals of the principal New England relief funds for the European War reached the following amounts:

| | |
|-----------------------------|-------------|
| Belgian Fund..... | \$91,350.50 |
| Serbian Fund..... | 62,660.69 |
| Allied Fund..... | 52,506.80 |
| French Wounded Fund.... | 41,553.59 |
| Armenian Fund..... | 29,131.37 |
| Surgical Dressings Fund.... | 17,297.00 |
| La Fayette Fund..... | 16,687.99 |
| Polish Fund..... | 16,320.48 |
| French Orphans' Fund.... | 15,997.10 |
| Italian Fund..... | 14,963.55 |
| French Refugees' Fund.... | 4,890.50 |

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending January 22, there were 330 deaths reported, with a rate of 22.63 per 1,000 population as compared with 231 and a rate of 16.09 for the corresponding week of last year. There were 11 deaths from influenza, and deaths from pneumonia numbered 70 against 30 last year.

There were 37 deaths under one year as compared with 40 last year, and 118 deaths over 60 years against 71 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 54; scarlet fever, 82; measles, 71; whooping cough, 49; typhoid fever, 1, and pulmonary tuberculosis, 49.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 11, and tuberculosis, 3.

Total deaths from these diseases were: Diphtheria, 3; measles, 2; whooping cough, 8, and tuberculosis, 28.

BAPTIST HOSPITAL.—The annual graduation exercises of the New England Baptist Hospital Training School for Nurses were held in Boston on January 19, under the presidency of Dr. George S. C. Badger. The principal address was by Dr. Charles A. Porter on his experiences with the second Harvard Unit in France. Diplomas were presented to a class of ten pupil candidates.

LEPROSY CARE IN MASSACHUSETTS.—In a recent address before the Lowell Institute, Dr. Richard P. Strong commented on the inadequate care of lepers in this state, comparing it with the efforts of the Government in the Philippines, whose establishment of a colony for the segregation and treatment of lepers was referred to in a recent issue of this JOURNAL. That the state has been very reluctant to make sufficient appropriations for the better care and housing of its lepers has been previously commented on in this JOURNAL, and it is especially deplorable in view of the recent efforts being made by Dr. J. A. Honey in the investigation and treatment

of the disease, and the word of so unquestionable authority as Dr. Strong should be of influence in renewed efforts to establish on Penikese Island a colony where victims of the malady may live in comfort and receive adequate care and treatment.

A NEW BUILDING PLANNED FOR THE MASSACHUSETTS COLLEGE OF PHARMACY.—The Massachusetts College of Pharmacy is actively planning for a new building to be erected on the site purchased a few years ago at the corner of Brookline and Longwood Avenues, Boston, very near the new buildings of the Harvard Medical School and in the great center of medical education and practice that is being developed in this part of Boston. In the immediate neighborhood are the Brigham Hospitals, the Children's Hospital, Harvard Dental School, Tufts Medical and Dental Schools, the Psychopathic Hospital, and the Huntington Cancer Hospital, the Carnegie Nutrition Laboratory and many other institutions of a similar nature.

The building is to be of an impressive character that will add much in the eyes of the general public to the dignity of the profession of pharmacy. The first floor is to be at ground level and will contain the chemistry and pharmacy laboratories, with apparatus rooms and instructors' rooms, a large study-room for men students, and also the heating plant and janitor's work shop. The middle or main floor will contain two lecture rooms, each with about 300 seats, the trustees' room, general offices, library, women's study-room and rooms for the professors. The upper floor will contain the materia medica laboratory with its stock room, the bacteriology laboratory, recitation rooms, alumni room and various other rooms of varying size and importance. In the central portion of the upper floor a large assembly room is to be included, with a capacity of five hundred, a stage at one end and store rooms adjoining. This room may be used for conventions, receptions and other social purposes, and for the commencement exercises of the College.

This College is in possession of an endowment amounting to two hundred and forty thousand dollars, but no part of the principal of this is to be used. The new building with its equipment, exclusive of its site, will cost in the neighborhood of two hundred thousand dollars, of which a part is to be obtained by the sale of the present building and its site, and a part is being raised by a campaign now under way. It may be necessary to put a mortgage on the building for a part of its cost, but it is hoped that this will be small in amount.

BOSTON SOCIETY FOR MEDICAL IMPROVEMENT.—The annual meeting of the Boston Society for Medical Improvement was held at the Medical Library on January 24, at 8.15 p.m. Dr.

L. H. Newburgh spoke on "Experimental Work in Pneumonia." The annual business meeting was held at 9 p.m., and the following officers were elected: President, Dr. Herman F. Vickery; secretary and treasurer, Dr. George G. Smith; members of prudential committee, Dr. C. F. Painter, Dr. D. F. Jones and Dr. J. J. Putnam.

BRATTLEBORO MUTUAL AID ASSOCIATION.—The eighth annual report of the Brattleboro (Vt.) Mutual Aid Association is a record of laudable efforts on the part of generous spirited women of that city to provide for the community assistance in sickness not offered by the hospitals, visiting nurses or by unorganized private nursing. Their activities include the services of a graduate nurse, who supervises a group of attendants. These attendants are trained to care for the sick, and do housework when desirable. They, of course, do not take charge of cases requiring skilled care. In these cases trained nurses can be supplied. But for families of small means, desiring assistance at special times, their services are helpful and inexpensive. In addition to these nurses are supplied for maternity cases, and efforts are made toward pregnancy care and instruction given in the care of the baby after the maternity nurse has left.

The activities of the Association also include the services of a school nurse and the management of a vacation house in Niantic, Conn.

THE HATHERLY MEDICAL CLUB.—The tenth anniversary of the Hatherly Medical Club was held on January 12 at the home of Dr. Walter P. Hutchinson. Dr. Gilman Osgood of Rockland spoke. The officers elected for the coming year were: Dr. C. E. Knight of Rockland, president; Dr. R. B. Rand of North Abington, vice-president; Dr. G. E. Hammond of Hanover, secretary; and treasurer, Dr. Wheatley of North Abington.

HOSPITAL BEQUESTS.—By the will of the late Joseph H. Baker of Beverly, the Beverly Hospital has been given \$500 and the New England Industrial School for Deaf Mutes \$300.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.—The annual meeting of the Massachusetts Association of Boards of Health is to be held in Boston on Thursday, Jan. 27. The first speaker will be Dr. Milton J. Rosenau of Brookline, on "The Causes and Modes of Diffusion of Influenza and Pneumonia," and this subject will be discussed by Dr. Francis X. Mahoney of Boston, Dr. James C. Coffey of Worcester and Dr. Charles B. Chapin of Providence, R. I. At the afternoon session there will be addresses by Mr. Robert N. Hoit of Wellesley on the "Standard

ization of Local Health Regulations," and by Mr. Seymour H. Stone of Boston on "The Incurable Consumptive."

AESCUAPIAN MIDWINTER MEETING.—The eleventh annual midwinter meeting of the Aesculapian Club of Boston was held at the Harvard Club on Saturday evening, January 8, 1916, at 9 p.m. One hundred members and 150 invited guests were present. The principal address was by Major Noble of the United States Army Medical Corps, who spoke of the great inadequacy of the present medical corps of the United States Army and Navy, and illustrated by figures and comparisons from the Civil War and present European conflict. He outlined the needs of the service and functions which should be fulfilled by civil physicians. He emphasized the need of filling the United States Medical Reserve Corps to its fullest capacity and referred to the course on military medicine which is to be given at the Harvard Medical School by Major Chamberlain.

WORK OF WORCESTER BACTERIOLOGICAL LABORATORY.—The Health Department announces to the physicians of Worcester that its Bacteriological Laboratory, after January 1, 1916, will be prepared to do the Wassermann test for syphilis and the so-called complement-fixation test for gonorrhea. This gonorrhreal test is especially for the more hidden manifestations of this disease, such as "rheumatism," pyosarthritis, etc.

These tests and the outfits for collecting the specimens will be furnished free of charge to physicians of Worcester. The tests will be made on Tuesdays and Fridays at the City Hospital laboratory, under the supervision of Dr. F. H. Baker, bacteriologist, and Dr. E. B. Bigelow, assistant bacteriologist, of this Department.

The history blank accompanying the outfit must be filled out completely with the exception that for name and address letters or numbers may be substituted.

It is to be distinctly understood that these examinations are only for bona fide residents of Worcester.

The Bacteriological Laboratory was opened August 1, 1894, and below is a list of diseases in which diagnostic work is undertaken, with the date of its inception.

- 1894 Diphtheria
- 1902 Tuberculosis
- 1908 Typhoid Fever
- 1908 Malaria
- 1916 Syphilis
- 1916 Gonorrhoea

The Laboratory has examined in all about 80,000 specimens.

Obituary.

DAVID WILLIAMS CHEEVER, M.D.

DAVID WILLIAMS CHEEVER, A.B., M.D., LL.D. (Harv.), was born in Portsmouth, N. H., November 30, 1831, and died in Boston, December 27, 1915, aged 84. He was the son of Dr. Charles Augustus and Adeline (Haven) Cheever, and the grandson of Dr. Abijah Cheever. He was a lineal descendant in the seventh generation from Ezekiel Cheever, who came from Canterbury, England, in 1637, was the first master of the Boston Latin School and eminent as a teacher for 70 years. Of the seven generations, four were graduated at Harvard and five were professional men.

Dr. Cheever graduated from Harvard in 1852 and from the Harvard Medical School in 1858. He at once began practice in Boston and continued therein for 56 years. In the early years of his professional life he saw a variety of service. He wrote for the *Atlantic Monthly* and the *North American Review*, and many papers for the medical journals. He was editor of the BOSTON MEDICAL AND SURGICAL JOURNAL a year and had charge of a hospital for smallpox for a time. He was acting assistant surgeon in the Judiciary Square Hospital, in Washington, for two months in 1862.

When Dr. Cheever began practice there were no specialists. All were general practitioners, a few paying more or less attention to surgery. In ten years the subject of this sketch had built up a large practice, including obstetrics. Heredity and other influences led him to pay especial attention to surgery. His grandfather was a surgeon in the Revolution and his father did the surgery in his vicinity. Doubtless the doctor's philosophical mind had most to do in his choice of a specialty. As he has well said, surgery is plain work compared to medicine. Its results are to be seen. The conditions are more controllable and hence the work is more satisfactory.

Dr. Cheever's appointment as demonstrator of anatomy at the Harvard Medical School in 1860, and that of surgeon at the Boston City Hospital upon its inauguration in 1864, gave him ample opportunities to fit himself for his brilliant career as a surgeon. His work at the Hospital and his teaching at the Harvard Medical School continued all his active professional life. In 1868 he was appointed adjunct professor of clinical surgery, professor of clinical surgery in 1875, professor of surgery in 1882, and professor emeritus in 1893. At this time he was made surgeon emeritus at the City Hospital.

In his opinion it was the duty of those holding hospital appointments "to give personal oversight to their patients, to teach, to write, to publish, to support and harmonize the staff, the trustees, the administration." He did all this and more. His sound judgment and wise counsel were always at the service of his fellows. As

a teacher he was clear, concise and practical. "Predigitation, terseness and extemporaneous speaking," in his opinion, were the chief factors of his success in teaching.

Aside from his "Lectures on Surgery," dedicated to 33 classes that had received his instruction, and five volumes of Medical and Surgical Reports of the Boston City Hospital, which he edited and for the publication of which he was chiefly responsible, he wrote and published more than sixty papers and addresses relating generally to professional topics.

Of his many miscellaneous papers, attention may be called to the following: Variola: The value and fallacy of statistics in the observation of disease (a Boylston prize essay, 1860, of lasting interest); Radical cures of hernia; Natural labor in phthisis; Leucocytemic tumors; Spontaneous fractures; Obstruction of the bowels; Dangers from anesthesia; Is the study of medicine a liberal education?; Medicine as a trade and as a profession; Shattuck Lecture on the new surgery; Does medicine advance?; Evolution checked; Mental condition before operation; Privileged medical communication; The ideal doctor; Medicine and religion; Reminiscences of his professional life; and several others that will appear later. The character of his writings, however, is of far more importance than their number. As many of them have a lasting interest and value, it is to be hoped that a collection of them in a convenient form may be available in the near future.

For many years Dr. Cheever was a leader in the surgical world. He was deliberate and careful in diagnosis and treatment, bold in emergencies, thorough in his operations, and most assiduous in the after-care of his patients, their welfare taking precedence of everything else. His hospital patients were treated with the same consideration as his private patients,—kindly, thoughtful, painstaking. In his practice and in his teachings he insisted upon the importance of paying personal attention to details. Nothing escaped his notice. When possible, he kept his patients in bed a few days prior to subjecting them to a serious operation. After the operation was performed, he usually applied the dressings himself and often saw his patients placed comfortably in bed. He usually saw them a few hours later to assure himself that all was going well. Furthermore, his interest did not cease with the operation; the after-care was most faithful and efficient. The important details of his serious cases were never forgotten, thus serving as a sure foundation of his sound judgment.

The doctor performed many original, or unusual operations, such as esophagotomy (6 cases) for foreign bodies; the first Caesarean section in this vicinity; depression and replacing the upper jaw for the removal of pharyngeal tumors; removal of malignant tonsils through an external incision; Cook's operation for perineal section; excision of hip; removal

of the Gasserian ganglion for inveterate neuralgia; Wood's operation for the radical cure of hernia; transfusion, etc. He reported over 1200 major hospital operations, with a recovery of 85%, a wonderful record considering the character of the cases and the risks of surgery in those days,—mainly pre-aseptic,—when sepsis, erysipelas, pyemia, etc., were rife and practically all wounds suppured.

Medical charity always interested the doctor, as he devoted no small portion of his active life to its service both in hospital and in private practice. He was emphatic in his opinion that the well-to-do in our hospitals should pay for the professional services received therein. The staff willingly cares for the poor without fees, but it is unjust to ask them to give their services to the rich upon the same conditions, as is the custom in some of our institutions.

Upon the occasion of receiving a loving cup from the staff of the City Hospital some years ago, Dr. Cheever spoke as follows: "In private life and in public life I can honestly say that I have tried to advance our profession. I have given whatever I could afford to give away solely to medical purposes and objects: the School, the Hospital, the Medical Library, the Medical Benevolent Society. The welfare of my medical brethren has been in my thoughts prominently and permanently." Every one at all familiar with his life can attest the truth of these statements. His life was consistent therewith.

Many years ago he established a scholarship in the Harvard Medical School for the benefit of first-year students, the first one of that order in the school, all the others being for the advanced classes. He also established a fund at the City Hospital for the purpose of presenting a case of surgical instruments to each graduate of the surgical department of that institution. While, as a rule, his charities were not large, yet they were numerous. As might be expected, they were judicious. He gave unflinching interest and help to the needs of many individuals who came to his knowledge.

Dr. Cheever belonged to several associations, chiefly medical, at which he was a constant attendant, frequently speaking and presenting papers. He had been president of the American Surgical Association, Massachusetts Medical Society, Boston Medical Library and the Massachusetts Medical Benevolent Society. He was Associate Fellow of the College of Physicians of Philadelphia, Hon. Fellow of the American College of Surgeons, Hon. Mem. N. H. Medical Society, and Associate Member of the Surgical Society of Paris. He was an Overseer of Harvard University twelve years. He was trustee of Mt. Auburn Cemetery for the same period. He took much interest in cremation and was consistent therein. It was established during his service there. He was a member of St. Botolph and Boston Athletic Clubs. He be-

longed to what was known as the "old men's class in gymnastics" at the latter, and for 17 years, when in town, attended it regularly five days in the week! The doctor was always much interested in the Latin classics, having received a thorough drill therein in his youth, and reading them readily in the original. His favorite English novelist was Thackeray. Of late years he had spent as much time as possible in the open air, riding horseback, walking and supervising his farm in Dedham, in which he took the greatest interest. His long life was due in no slight degree to his calm temperament, his philosophical mind, his sensible habits, and the wise regulation of his daily activities. Many might well learn a lesson therefrom.

In 1861 Dr. Cheever married Miss Annie C., daughter of Thaddeus and Sarah (Chamberlain) Nichols of Boston, who survives him, as do four of the six children: Dr. David Cheever of the Harvard Medical School and of the surgical staff of the Peter Bent Brigham Hospital, now in charge of the second Harvard Unit at a British hospital in France; Adeline, wife of Dr. George S. Whiteside of Portland, Oregon, and Misses Alice and Helen Cheever of Boston, the latter well known for her interest in charitable work in this vicinity.

The prominent features of Dr. Cheever's life were character and service. His ideals were sane and noble, his tastes refined, his standards were high, and his daily life consistent therewith. He was truth and justice personified. His devotion to duty was limited only by his time and strength. Swayed less by impulse than most men, his judgment was sound and his advice dependable. He was a tower of strength and comfort in time of trouble. Kindly in his feelings, lenient in his criticism, just in his estimates of people, he was ready at all times to help his fellow men. For half a century he has been a guide and an inspiration to his fellows. His life has been a benison to his family, to his patients and to his friends. A fine type of man, a public spirited citizen, an eminent surgeon, an honor to his profession and to his alma mater, an occupant of many important positions and never found wanting, he will be missed in the community, and the void in the hearts of his family and his friends will never be filled.

GEORGE W. GAY, M.D.

SUMNER EDWARDS, M.D.

The death of SUMNER EDWARDS, which occurred on January 6, 1916, ended suddenly a life of much promise. Edwards was twenty-six years of age and so just entering upon his life's work when the summons came. After spending his boyhood in Bethel, Maine, he entered Bowdoin College for his collegiate training. There he entered very keenly into the college life; he

was a member of the Theta Delta Chi fraternity; he was prominent in track athletics, and in his senior year he was president of his class. He was an excellent student, as shown by his election to the Phi Beta Kappa. He graduated from Bowdoin in 1910 with the A.B. degree. He then spent a year at Hebron Academy, Maine, before entering upon the study of medicine at Harvard. At Harvard, as at Bowdoin, he was active in the student life, being a member of the Innominate, Aesculapian and Boylston Societies and the Phi Rho Sigma Fraternity, and one year president of his class. He graduated in 1915, receiving the M.D. degree *cum laude*. In a competitive examination in January, 1915, he won a place as medical house-officer at the Peter Bent Brigham Hospital. About the middle of October, 1915, he came on duty for this work.

In his term at the hospital he was efficient, doing his work exceedingly well. His bearing was modest; he was pleasant in his relations to all of his associates on the hospital staff and to the patients, and so he came to be greatly liked by all in the hospital. His illness began, as did many of the cases of the recent epidemic of grippa, with a high fever and great prostration. In a few days lobar pneumonia developed in one lower lobe of his lung and shortly the other lower lobe became involved. The infecting organism was type No. 1 pneumococcus and from the early days of his illness he was very sick. His illness and death cast gloom over the entire institution. The medical staff has lost a very well liked member whose presence will be missed for a long time to come.

On January ninth his funeral services were held in his old home at Bethel, Maine, and he was buried in the cemetery on a low knoll by the river with a distant view of that lovely range of hills which he doubtless loved to look upon when at Bethel.

At a recent meeting of the governing board of the Peter Bent Brigham Hospital the following resolution was adopted:

"The Board of Incorporators learns with deep regret of the death of Dr. Sumner Edwards, House Officer of the Peter Bent Brigham Hospital.

"We deplore the loss to the hospital of his efficient and faithful services, and realize that still greater is the ultimate loss of a man of his promise to his profession and the public. We offer our deep sympathy to his mother."

HENRY A. CHRISTIAN.

JOSEPH HENDLEY TOWNSEND, M.D.

Dr. JOSEPH HENDLEY TOWNSEND, for the past ten years secretary of the Connecticut State Board of Health and a prominent physician of New Haven, died at his home in that city on January 7 of influenza, culminating in pneu-

monia and cardiac failure. He was born in New Haven on January 18, 1862, and received the degree of A.B. from Yale in 1885 and that of M.D. in 1887. After serving two years as an interne at the New Haven Hospital, he settled in the practice of his profession in that city. He was surgeon of the Second Regiment of the Connecticut National Guard and later became chief surgeon of the State Militia, with a rank of Major.

In 1901, Dr. Townsend was appointed to the Connecticut State Board of Health, and became its secretary in 1906, a service which constitutes his most valuable contribution to the interests of public health. He was a member of the American Public Health Association, the Association of Military Surgeons of the United States, and was treasurer of the Connecticut Medical Society and president of the New Haven Medical Association and the New Haven County Association.

In 1891 Dr. Townsend was appointed assistant in clinical medicine at the Yale Medical School, where he became demonstrator of obstetrics in 1892 and lecturer on hygiene in 1894. He was the author of many contributions to medical literature and for ten years had edited the monthly bulletin of the Connecticut State Board of Health. He is survived by his widow.

Miscellany.

NOTICE.

MASSACHUSETTS SCHOOL FOR HEALTH OFFICERS.

Special Lectures in February.

All lectures will be given from five to six o'clock on the dates specified and in the amphitheatre of Building E. of the Harvard Medical School, unless otherwise indicated. All lectures will begin promptly on the hour.

February 1. "Sanitary Law." Prof. Eugene Wambaugh, Harvard Law School.

February 2. "Tuberculosis" (6 lectures). Dr. John B. Hawes, 2d, Secretary Board of Trustees, Massachusetts Hospital for Consumptives.

February 3. "Mental Hygiene" (6 lectures). Dr. E. E. Southard (and assistants), Director Psychopathic Hospital, Boston.

February 4. "Personal Hygiene" (6 lectures). Prof. W. B. Cannon, Professor of Physiology, Harvard Medical School.

February 8. "Sanitary Law." Prof. Eugene Wambaugh.

February 9. "Personal Hygiene." Prof. W. B. Cannon.

February 10. "Mental Hygiene." Dr. E. E. Southard and assistants.

February 11. "Tuberculosis." Dr. John B. Hawes, 2d.

February 14. "Tuberculosis." Dr. John B. Hawes, 2d.

February 15. "Sanitary Law." Prof. Eugene Wambaugh.

February 16. "Personal Hygiene." Prof. W. B. Cannon.

February 17. "Mental Hygiene." Dr. E. E. Southard and assistants.

February 18. "Tuberculosis." Dr. John B. Hawes, 2d.

February 23. "Personal Hygiene." Prof. W. B. Cannon.

February 24. "Mental Hygiene." Dr. E. E. Southard and assistants.

February 25. "Tuberculosis." Dr. John B. Hawes, 2d.

February 29. "Tuberculosis." Dr. John B. Hawes, 2d.

* Series continued from January course.

† Lecture will be given at the Psychopathic Hospital, 74 Fenwood Road, Boston.

SOCIETY NOTICES.

HARVARD MEDICAL SOCIETY.—There will be a historical club meeting in the Peter Bent Brigham Hospital amphitheatre on Tuesday evening, February 1, 1916. Program: "Leonardo da Vinci's Researches in the Circulatory and Nervous Systems." Dr. Arnold C. Klebs, Washington, D. C. Medical students and physicians are cordially invited to attend.

ERNEST G. GRAY, *Secretary.*

MASSACHUSETTS SOCIETY OF EXAMINING PHYSICIANS.—The Massachusetts Society of Examining Physicians will hold its annual meeting at the Boston City Club, January 26, 1916, at 8:00 P.M.

Gastric and Duodenal Ulcer.

1. Etiology and Physiology Dr. Franklin J. White
2. Surgical Treatment Dr. William M. Conant
3. Intra-abdominal Pressure Dr. Walter B. Cannon
4. Roentgenological Diagnosis (Screen) Dr. Walter J. Dodd and Dr. Arial W. George
5. Analysis of City Hospital Cases for Ten Years Dr. Irving J. Walker

Election of officers.

JAMES H. STEVENS, M.D., *Secretary.*

BOSTON PSYCHOPATHIC HOSPITAL.—The fifth "Authors' Evening" of ten papers, A Contribution to the Management of the Speech Disorder Problem in the Public Schools (Results of a speech defect survey in 20 cities) by Walter B. Swift, M.D., and assistants, C. A. Osborne, M.D., Ph.D., Second Assistant, Miss Jennie Hedrick, Once Voluntary Assistant, and Miss Grace T. Brown, will be held at the Voice Clinic, Psychopathic Hospital, 74 Fenwood Road, Brookline, Mass., January 28, 1916, at 8:00 P.M.

Introduction: The Scope of the Survey.

1. Report of Speech Defects in Rochester, N. Y.
2. Data on Speech Improvement from Western Cities.
3. Approaching the Speech Problem in the Middle South.
4. What Eastern Cities are Doing in Speech Defects.
5. A Note on the Speech Problem in Washington, D. C.
6. Report on Speech Possibilities in Springfield and Worcester.
7. Why New York Stands First in Treating Speech Disorder.
8. Causes for Inefficient Results in Speech Work.
9. The Speech Problem as a Preventative of Crime and Prostitution.
10. Problems and Possibilities of Prevention of Speech Disorder.

Physicians and medical students invited. If you expect to attend, mail a postal to 110 Bay State Road, Boston.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER (BOSTON COMMITTEE).—A meeting will be held on Saturday, January 29, at 4:00 P.M., at the Boston Medical Library, to discuss further measures which may be employed for the instruction of the public in regard to cancer. To this meeting public health officers from many quarters of the State have been invited.

Speakers: Dr. Francis Carter Wood of the Crocker Research Fund, New York; Dr. Eugene R. Kelley of the Massachusetts State Board of Health, and Dr. Edward Reynolds of Boston.

The medical profession is invited.